

WESTERN INDUSTRY



4th annual REVIEW and FORECAST

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JANUARY 1952



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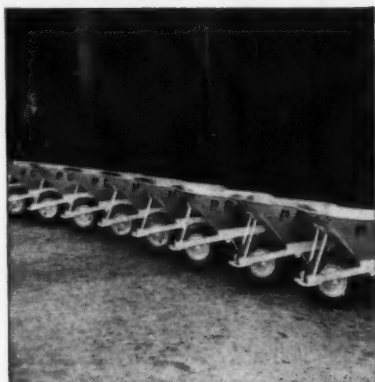
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FEBRUARY	North American Aviation, Inc., Inglewood, Calif.
MARCH	Boeing Airplane Company, Seattle, Wash.
APRIL	California Packing Corp., Oakland, Calif.
MAY	Alexander Film Co., Colorado Springs, Colo.
JUNE	Pillsbury Mills, Inc., Culver City, Calif.

JULY	Anaconda Copper Mining Company, Anaconda, Mont.
AUGUST	Materials Handling Cartoon
SEPTEMBER	B. F. Goodrich Company, Los Angeles, Calif.
OCTOBER	Security Parachute Co., San Leandro, Calif.
NOVEMBER	United States Vanadium Co. mill at Uravan, Colo.
DECEMBER	W. P. Fuller & Co., South San Francisco, Calif.

B.F. Goodrich



Wheelbarrows for light hauls



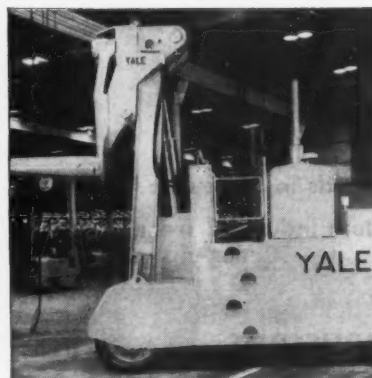
Moving heavy material for shipment



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Capable of handling heaviest loads



Loading heavy shipments in freight cars

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A similar program is available for manufacturers of industrial hauling equipment.

only B. F. Goodrich has a complete line of industrial tires.



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Akron, Ohio

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Company

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WESTERN INDUSTRY



VOLUME XVII

JANUARY • 1952

NUMBER 1

ANNUAL REVIEW and FORECAST NUMBER

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Biggest hotel built anywhere in 20 years

-gets a Koppers Built-Up Roof!



Architect's sketch of new Hotel Statler, Los Angeles, Calif. The Koppers Roof will be bonded for 20 years.

Architects and Engineers: Holabird & Root & Burgee, Chicago, Ill. Associate Architect: William B. Tabler.

General Contractor: Robert E. McKee, General Contractor, Inc., Glendale, Calif.

Roofing Contractor: Associated Roof Co., Los Angeles, Calif.

● With 1,275 guest rooms, the new 13-story Hotel Statler, now under construction in downtown Los Angeles, will be the biggest hotel built *anywhere* in the past 20 years. Truly a showplace, too, with promenade decks, tropical planting, sun decks, airing porches, and a swimming pool in the patio.

Built-up roofing will protect this ultra-modern hotel and Koppers Roofing Materials are being used exclusively. A wise choice, because roofs built up with Koppers Coal Tar Pitch and Approved Tarred Felt resist prolonged contact with water *without*

deteriorating, and are actually self-sealing if small breaks occur.

As for long life, a Koppers Bond will *guarantee* the performance of the roofing materials on this roof for 20 years. Your roof can have the same guarantee—for 10, 15, or 20 years if it is applied by an Approved Roofer according to Koppers specifications.

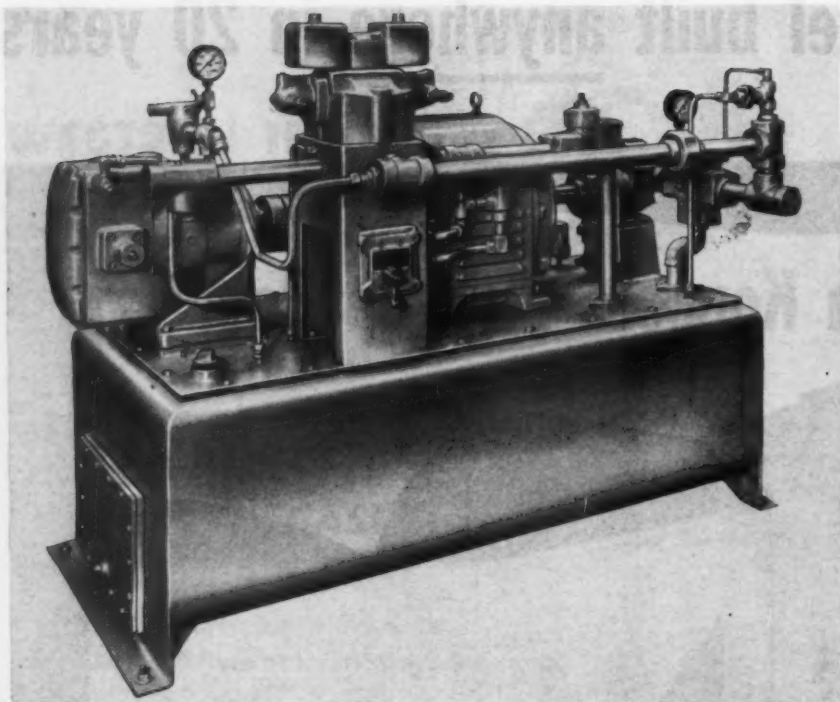
Koppers Roofing Materials are available throughout the United States, including the West Coast. Specify these materials, and your projects will have the best in built-up roofing. Get in touch with us for full information and specifications.



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DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH AND WOODWARD, ALABAMA

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► Packaged hydraulic power and control unit designed by RUCKER expressly for conversion of older, slow-speed presses and extrusion machines. It ups production by increasing return and approach speeds and pressures of ram. Unit pictured has dual pump for (1) high volume and low pressure—32 g. p. m. at 1000 p. s. i.; (2) moderate volume and high pressure—20 g. p. m. at 2000 p. s. i. with maximum of 4000 p. s. i.

How to Increase Production When You Can't Buy Machine Tools

Modernize With RUCKER-Designed Fluid Power Systems

If your job requires variable speeds, horsepower and torque . . . or you want a safe, explosion-proof, waterproof power system . . . or chatter-free, accurate operation with quick starts, stops and reverses, call RUCKER.

Specialists in Hydraulic and Pneumatic Power

RUCKER is the West's largest firm specializing in fluid power problems. We are equipped to do the complete job of designing and building to your exact needs; whether it be conversion of older installa-

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- Our field men are all experienced mechanical or chemical engineers.
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Metal shears
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Feed rolls
Oil drilling rigs
Concrete pipe equipment
Batching plants
Conveyors
Dam gates
Special machinery

Our Customers Include Leaders in...

Chemical & oil processing
Metalworking
Pulp & paper
Lumber and plywood
Canning and packing
Farming and dairying
Construction
Aviation
Ceramics
Fishing

See for yourself—call us for installations nearest you.

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Here is the original high grade hacksaw blade—the blade that has stood the toughest tests of time for more than a quarter of a century! . . . For tough, high carbon steels it is unsurpassed by any blade in the world! It reduces costs by delivering more sawing per blade.

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Unequaled for sawing lower alloy steels! Tough, yet exceptionally flexible. Here's a blade that will give you fast, clean cutting to very close tolerances—and with the very minimum of breakage and chipping! Invaluable where high production is essential!



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January, 1952—WESTERN INDUSTRY

Our March 10...

METALS ISSUE WESTERN INDUSTRY

Tell your story in this information-packed

METALS SHOW-IN-PRINT

Advertising forms close Feb. 5

Reserve Space NOW

That WESTERN INDUSTRY paces the steady, almost spectacular growth of metalworking in the West will be proved again through its editorial coverage of this market in the MARCH METALS ISSUE. All production and management men will be doubly interested in such feature articles as . . .

What's ahead for metal and metalworking industries in the West—Symposium by Western chapter chairmen of American Society of Metals, American Foundrymen's Association and American Welding Society. Plus . . .

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- Late developments in alloy materials and processing.
- Titanium: its uses and applications.
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- Impregnation of metal castings.
- Arc air gouging.
- Metal bearings: uses and problems.

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1950	1951*	% Increase
505 pages	647 pages	28%

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*November through October.

You, too, can cash in on the Western industrial market. Reserve space NOW in WESTERN INDUSTRY's Metals Issue. Remember, regular rates apply.

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WESTERN INDUSTRY gives you coverage every month of 3962 men in Western metalworking plants. You reach 5041 additional readers in chemical, mineral, food, lumber and transportation industries, etc. — an effective circulation of more than 9200 (June, 1951 CCA statement) men who manage, buy and specify for Western plants.



Growing—that's the story of the San Francisco Division of Federal Mogul Bearing, and hundreds of other Western metalworking plants.

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FOR HEAVY DUTY
HIGH SPEED
OPERATION

new
unprecedented

“61”

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3000 POUND RATING —

PLUS 61 INCH OUTSIDE TURNING RADIUS provide ideal heavy duty, high speed, warehouse fork truck.

MOST STABLE, MOST MANEUVERABLE, AND SAFEST 3000 lb. capacity fork truck for handling up to 48" long loads. Can also be used for transporting up to 4000 lbs. in load lengths up to 32".

Plus these extra "Standrive" Advantages.

STANDDRIVING IN REVERSE IS AS EASY AS FORWARD. Trailing the load gives full vision with convenient operation.

EASY ON, EASY OFF! Clear through corridor allows quick exit and entrance either side. Saves hours of operator's time on supplemental duties. Meets Government and industry safety regulations.

CAPACITIES

3000 Lbs.
up to 48" load length

LIFT 127"
(collapsed height 83")

TURNING RADIUS
61"

MINIMUM AISLES

Will right angle stack 40" long pallets in 10' aisles with recommended operating clearance.

Plus

GREATER LATERAL STABILITY

NEW welded frame and NEW counter-weighted construction provide ideal weight distribution — lowest center of gravity.

Plus

NO GREASE POINTS

Absolutely no points requiring periodic lubrication.

Plus

LESS DOWN TIME

Highest Quality components. All adjustments, inspection and normal maintenance can be made from the top side of the truck.

Plus

FASTER LIFT

New, high-efficient lifting motor and hydraulic pump.

Plus

GREATER SAFETY

Center control, stand-up operation acknowledged the ultimate for safety.

Send for Bulletin
"61"



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The "MASTER" Line

LEWIS-SHEPARD PRODUCTS INC., 141 WALNUT STREET, WATERTOWN 72, MASS.

Consult Your
Yellow Phone Book

Midwest Plant CRAWFORDSVILLE, INDIANA

Sales-Service
In Principal Cities



SAVES \$5,000 YEARLY ON STEEL COST

**Unloading Time
Cut 2 Hours
Per Railroad Car**

5-ton, 3-runway, 50-ft. span, completely motorized Cleveland Tramrail bridge operated by pushbuttons from floor. Bridge is shown interlocked with track extending out doorway over railroad. This Tramrail system has been in service since 1943.

A handsome dividend is being earned by the Kortick Manufacturing Co., San Francisco, Calif., on its Tramrail transfer bridge installation.

Because the bridge is of 5 tons capacity, the rods, bars and angle iron which Kortick uses for the manufacture of pole line hardware, can be bought and handled in 5-ton bundles. This eliminates a bundling charge made for smaller bundles. The savings is \$2.00 per ton. As Kortick takes in an average of 200 tons per month, the monthly saving amounts to \$400.

The bridge interlocks with an outside Tramrail track that extends over a railroad track. This enables the hoist carrier to deliver steel directly from railroad cars to any point inside the building served by the bridge. Because of this feature and the fact that heavier bundles are handled, a saving of about 2 hours unloading time is made per 50-ton car of steel, over their former method which employed a 3-ton hoist.

Obviously with total savings running in the neighborhood of \$5,000 yearly, it did not take long for this Tramrail installation to pay for itself.



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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.

8861 East 284th St., Wickliffe, Ohio

CLEVELAND  TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT



AIRCO ACCURACY...

PRECISION... OPERATING ECONOMY

designed into the all new

AIRCO NO. 50 TRAVOGRAPH

GAS CUTTING MACHINE

Airco's NEW No. 50 Travograph is a rugged, all-welded gas cutting machine. Its massive, long-lived design is engineered to give fingertip sensitivity to all production operations. Used as a basic tool for multi-torch shape cutting, squaring or beveling, its outstanding accuracy slashes reject loss and working costs to a minimum.

Today's most modern production tool, the rugged new Airco No. 50 Travograph precision-cuts steel—light plates, heavy slabs, billets, forgings—to close tolerances. Here are the reasons for its remarkable exactness . . . the "why" it guarantees faithful reproduction.

1. All-welded construction provides a combination of ruggedness, resistance to vibration, and precision operation.
2. Rigidity built into the torch-bearing pantograph arms enables the torch bar to support a uniform load of 500 lbs!
3. Perfectly-balanced when properly set on 16' rails.
4. Ball bearings in the hinge joints make it extremely smooth operating.

For greatest operating flexibility, the new No. 50 Travograph can be equipped with three distinctly different tracing devices—manual, magnetic, or the full-automatic "Electronic Bloodhound". The "Electronic Bloodhound" needs only an outline drawing or silhouette to cut the most intricate shapes smoothly, sharply, quickly . . . and with extreme accuracy.

If your production line requires quantity flame shaping operations . . . and if close precision cutting would lower your finish-machining costs . . . it will pay you to investigate Airco's new No. 50 Travograph. For complete information write your nearest Airco office for the new catalog just coming off the press.



AIR REDUCTION PACIFIC COMPANY

A Division of Air Reduction Company, Incorporated

SAN FRANCISCO • LOS ANGELES • PORTLAND • SEATTLE

Bakersfield • Fresno • Emeryville • Sacramento • Tacoma

Western Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories



SELL YOUR BRASS MILL SCRAP PROMPTLY

To keep production rolling

Help lick the shortage of brass and copper. Make sure that every pile of brass mill scrap in your factory — even if it is only a hundred pounds — is sold at once.

Not only is this scrap immediately salable on today's market — it will bring vital metal to the production lines where it is sorely needed.

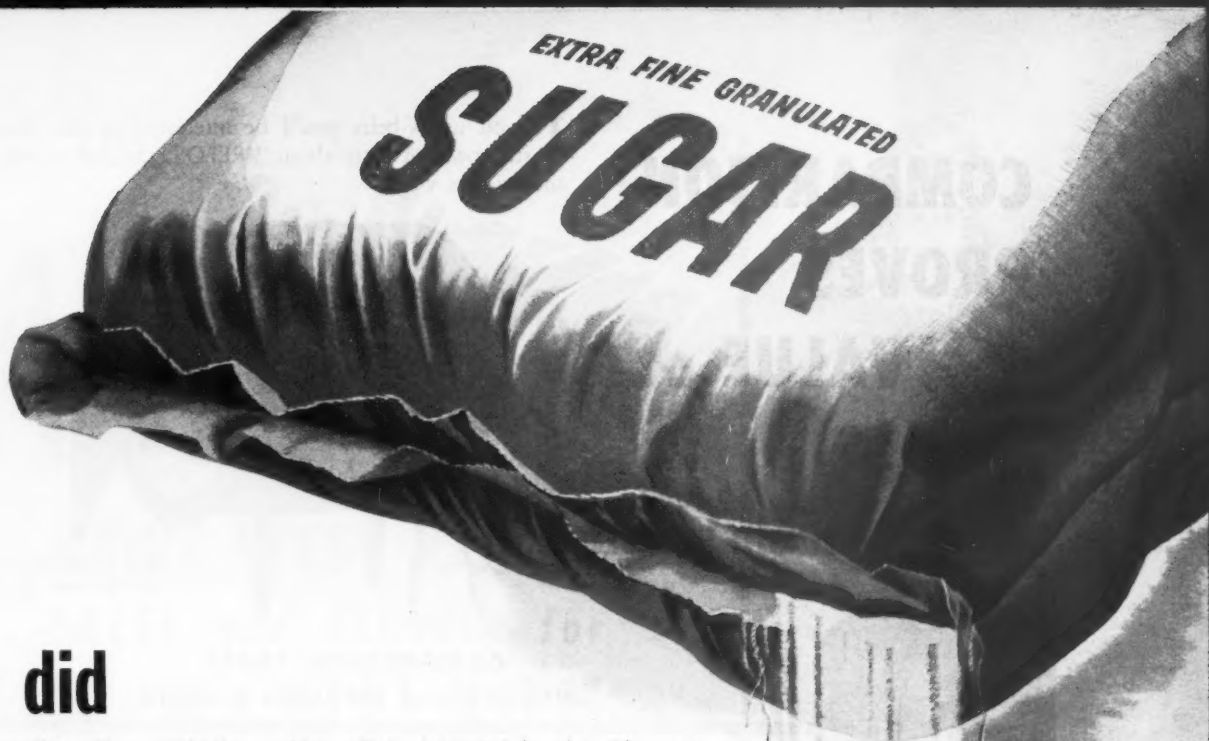
Both the defense program and civilian needs require more and more copper and brass. To prevent increased shortages and even more stringent regulations, see that *your* brass mill scrap is moved promptly.

Chase  **BRASS & COPPER**

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

• The Nation's Headquarters for Brass & Copper

Albany†	Cleveland	Kansas City, Mo.	New York	San Francisco
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Boston	Detroit	Minneapolis	Providence	
Chicago	Houston†	Newark	Rochester†	(sales office only)
Cincinnati	Indianapolis	New Orleans	St. Louis	



They did

Every executive with a production problem will be interested in what this sugar refinery operator* did to solve his. During a concentrated six-month sugar harvest, machines must operate at peak capacity. Complete dependability is a vital factor because a perishable commodity is at stake. To increase production and insure continuous operation, this operator decided to modernize his mill.

what

He turned to Westinghouse engineers for help on the electrical apparatus. He asked for a method, an operating proposal—not just a quotation on apparatus. His staff and ours worked out a system for power generation, distribution and utilization including integrated drives for the centrifugals. This is a system of many devices. Result . . . automatic operation increased over-all efficiency, reduced manpower requirements; stand-by problems were eliminated; valuable factory space was conserved through removal of belts and pulleys; maintenance became negligible.

ER you can do

You can profit by this operator's experience. It proves that capacity problems are solved with capacity thinking. We want to do that kind of thinking with you and your engineers.

to produce more

The actual devices can be selected later. It's how you put them together that counts—whether elevators, stokers, turbines, motors or transformers. Many manufacturers make good electrical apparatus. Westinghouse, in fact, makes a broader line than anyone else. But the priceless ingredient Westinghouse offers you, in addition, is the skill of broadly experienced engineers in putting together the right combination of good apparatus to let you produce more with what you have. Westinghouse Electric Corporation, Pittsburgh, Pa.



*name on request

YOU CAN BE SURE...IF IT'S
Westinghouse

COMPARISON PROVES the VALUE of VEELOS the Adjustable V-Belt...

If you use v-belts you'll be interested in this clear statement of facts about VEELOS, the link v-belt, and endless v-belts.



These 4 reels of Veeelos provide up to 316 standard v-belt sizes.

COMPARISON TABLE
VEELOS and ENDLESS V-BELTS

	Veelos V-Belts	Endless V-Belts
ADJUSTABILITY	Any length can be provided for any v-belt drive due to link construction.	Standard or special lengths must be supplied for individual drives.
INVENTORY	MINIMUM INVENTORY. 4 reels can care for every v-belt need in the O, A, B and C widths. No deterioration or obsolescence of spare belts.	LARGE INVENTORY. 316 sizes are required to provide a complete stock in the O, A, B and C widths. Spare belts not immediately used will age and deteriorate.
SPACE REQUIREMENT	SMALL SPACE. It takes less than 2 square feet of wall or floor space to store 4 reels of easily identified Veeelos.	LARGE SPACE. Walls and ceilings are often covered with stocks of endless v-belts. Identifying and maintaining full stocks is difficult and costly.
INSTALLATION	Installs quickly on any drive without resetting motor or tearing down outboard bearings.	Necessary to reset motor and tear down drives with outboard bearings.
MAINTENANCE	Belts can be adjusted or replaced without moving the motor.	Sliding or pivoted motor bases are necessary to replace endless v-belts. Belts cannot be adjusted individually.
OPERATING EFFICIENCY	Full power delivery can be maintained because the tension of each belt in a matched set is kept uniform by removing or adding links.	Individual belts cannot be adjusted to maintain uniform tension and provide full power delivery.
DRIVE LIMITATIONS	No limitations are imposed by belt length.	Limited by the availability of standard or special belt lengths.



If you would like to learn more about Veeelos—how it can save you money and keep your machines producing—write today for your copy of the Veeelos Data Book. It's free and full of facts!



MANHEIM MANUFACTURING & BELTING COMPANY
MANHEIM, PENNSYLVANIA

... ADJUSTABLE TO ANY LENGTH ... ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof and static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

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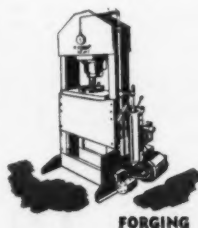
Now! K. R. Wilson Hydraulic Press Sales and Service to serve all Western Industry—from a Los Angeles Office and Warehouse!

Tremendous industrial growth, throughout all the west, has resulted in an increased demand for KRW Hydraulic Press Equipment. To meet this demand a fully staffed Sales and Service Office and Warehouse, amply stocked with KRW Standard Model Presses and Genuine KRW Press Parts, will be maintained to render better and faster service to all KRW western customers.

If you are not acquainted with K. R. Wilson Hydraulic Presses, stop in at this new office and warehouse. See this outstanding line of hydraulic presses—operate them yourself! KRW makes a hydraulic press to do your job easier, better, faster—AT LOWER COST!

To all old KRW Hydraulic Press Users, we maintain 24 Hour Service on all KRW standard presses, and IMMEDIATE DELIVERY of ALL GENUINE KRW REPAIR PARTS.

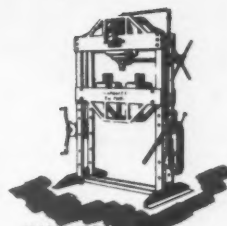
**Hand, Air-Oil, Motor Operated
Hydraulic Presses in capacities
from 25 to 200 tons.**



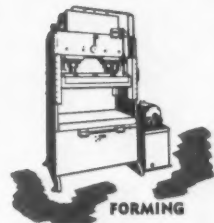
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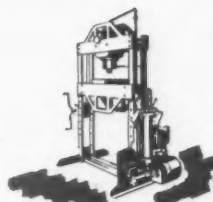
HAND OPERATED
GENERAL PURPOSE



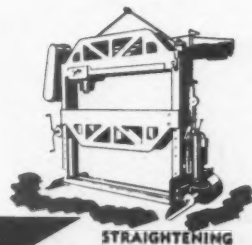
FORMING



BENDING



MOTOR OPERATED



STRAIGHTENING

K. R. Wilson Hydraulic Press Sales & Service



extrusions

by Plastic Process

Illustrated are some of the various types of extrusions produced by the Plastic Process Co., Inc.

Plastic Process was the first to extrude plastics in the West—and is rated first class not only in equipment, but in ingenuity of applications.

Your extrusion problem can be turned over to Plastic Process with complete confidence that if plastic extrusions are appropriate for the application, Plastic Process can do it supremely well.

The Plastic Process plant is equipped to handle every type of extrusion from monofilaments to twelve-inch sections in Thermoplastic Extrusions, including Polystyrene, Tenite, Ethyl Cellulose, Nylon, Vinyls, Acrylics, Acetates and Polyethylene.

Rods, Tubes, Mouldings, Rings, Beads—practically any form of extrusion you require can be produced in the materials most practical for each application and cut with our automatic equipment from $\frac{1}{8}$ " to any length desired at no additional cost.

Our Engineering Division will be pleased to help you solve your particular problem in extrusions—with efficiency and ECONOMY.

• THE PLASTIMODE roll-a-way door—"up at a touch and out of the way"—is a Plastic Process patent. In many colors. Sanitary, smart and easy to install.

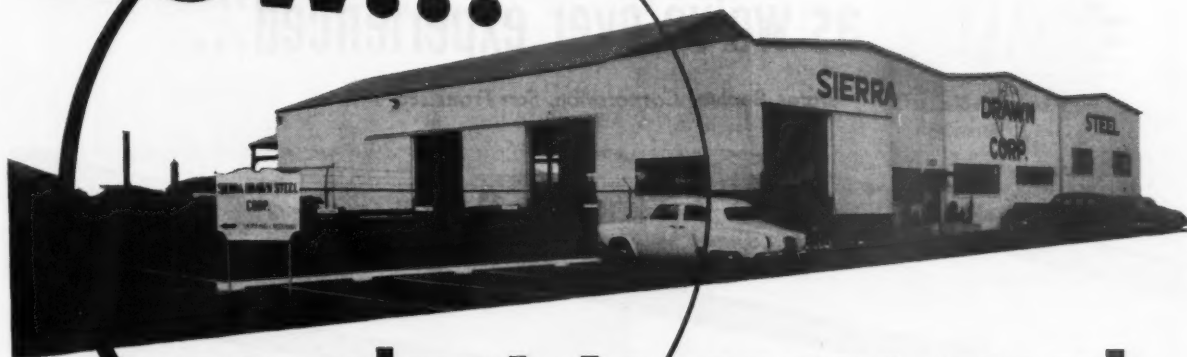
• FLUORESCENT FIXTURES —a Plastic Process specialty—virtually space heaters—lighting basements and more.

• MONOFILAMENTS of every type, uniform in dimension, cut to specified length at no additional charge with our automatic equipment.

PLASTIC PROCESS CO., INC.

10400 AVIATION BLVD., LOS ANGELES 45, CALIF.

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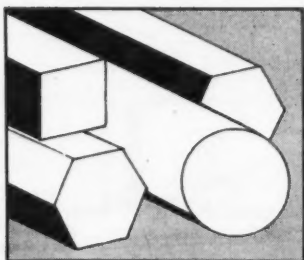


more plant to serve you!

Only Independently Owned

Cold Finishing Bar Mill

in the West



OFFERING YOU ...

HEXAGON...ROUND...SQUARE

Cold Finished Stock

SIERRA'S facilities increased

Here's additional capacity to serve you...capacity that will help you solve your steel supply problems.

Our new addition gives us the opportunity of serving you better in the production of quality cold finished bar steel. Complete metallurgical and engineering service assures highest quality. Efficient plant design assures production flexibility.

You are invited to inspect these modern facilities... at your service day and night.

As in the past, we will continue to produce only the finest quality cold drawn steel bars... steel that will meet your most exacting requirements for...

STRENGTH

MACHINABILITY

CLOSE TOLERANCE

FINISH



FOR SERVICE SAY SIERRA!

SIERRA DRAWN STEEL CORP.

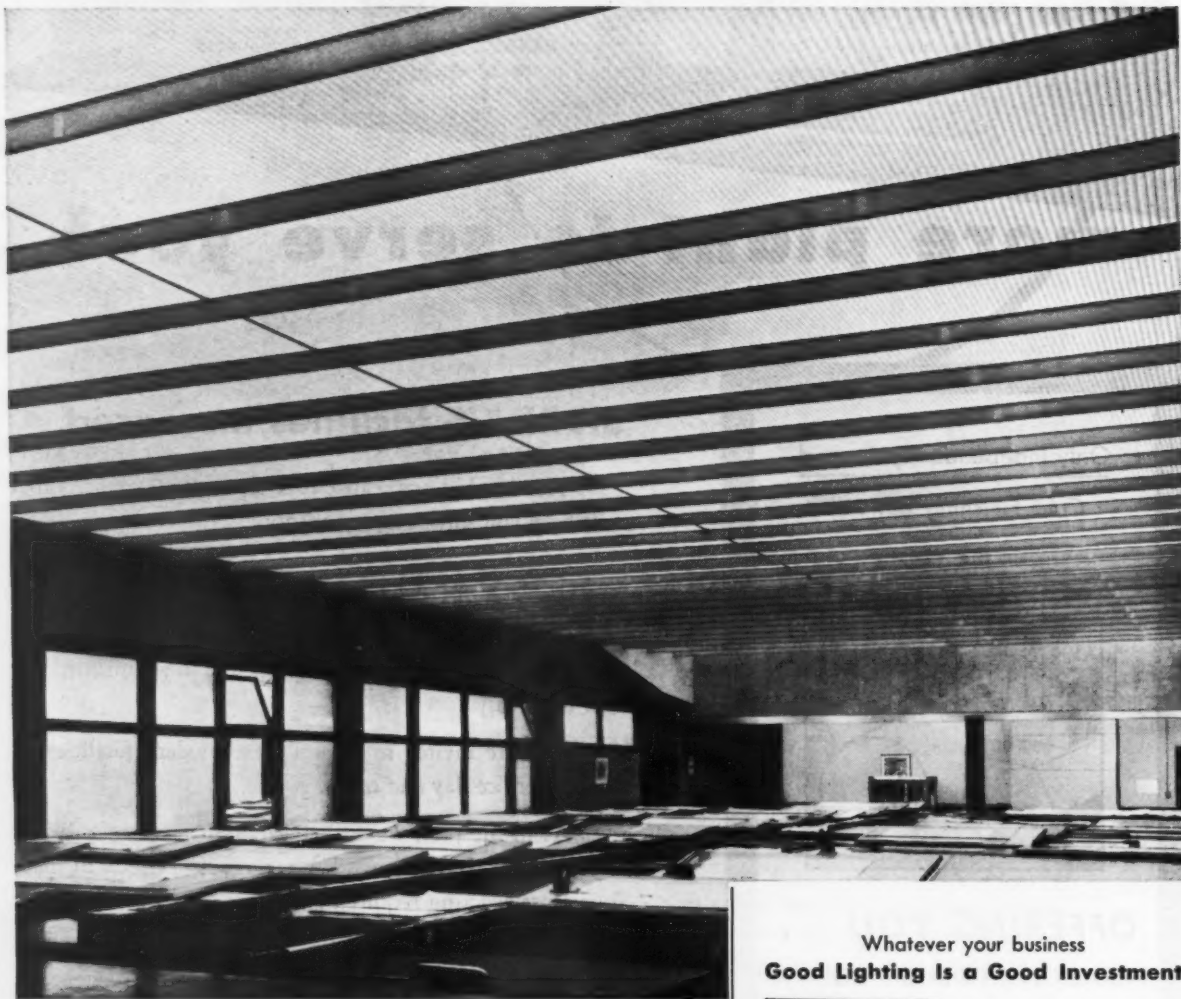
5821 E. Randolph St. Los Angeles 22 Underhill 0-3101

ONLY COLD FINISHING BAR MILL OWNED AND OPERATED IN THE WEST



Luminous ceiling "as nearly perfect as we've ever experienced"...

—states Bechtel Corporation, San Francisco



Modern fluorescent lighting in Bechtel's new drafting rooms

Is Modern Lighting a good investment? The Bechtel Corporation of San Francisco certainly thinks so. In their newly modernized building, at 101 California St., nearly three miles of fluorescent lighting tubes were used.

The level of evenly diffused light is rated by their engineers as "very good, even for fine detailed work," and officials of the company state "Our new lighting, with the luminous ceiling in our drafting room, is as nearly perfect as our draftsmen have ever experienced."

P·G·and·E·

PACIFIC GAS AND ELECTRIC COMPANY

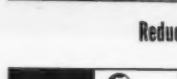
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18

Whatever your business Good Lighting Is a Good Investment



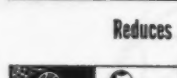
Increases production, sales



Reduces waste



Keeps employees happy, efficient



Reduces accidents



Increases cleanliness

For a survey of your lighting and ideas on how better lighting can help you, call the lighting engineer at your P. G. and E. office, or consult your contractor or engineer.

WESTERN INDUSTRY—January, 1952

For easier, better welding . . .

GRINNELL WELDING FITTINGS

A qualified welder can make welds quickly and easily with Grinnell Welding Fittings. These fittings are made by a hydraulic forging process that assures uniform wall thickness at all points and true circularity throughout. Of seamless, one-piece construction, they can be cut at any angle to match up with standard weight, and extra strong and heavier wall pipe in I.D. or O.D. sizes. Pressure-temperature ratings are equal to or greater than those of seamless steel pipe. Grinnell Welding Fittings are process stress-relieved.



**Permanent
Identification**

Each Welding Fitting bears a metal plate giving size, wall thickness, material and name for easy, positive identification.



Full Length Outlets

Full length outlets permit fast lining up and ample room for rod manipulation; keep high welding heat away from vital crotch zones.



**Uniform
Wall Thickness**

Uniform wall thickness at all points permits perfect lineup with pipe, O.D. and I.D. No thinning of long outer wall . . . no thickening of short inner wall. Complies with code requirements.



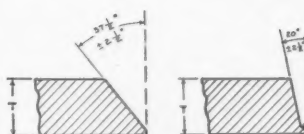
**True Circular
Section**

True circular section at all points makes fitting easy to align and weld . . . no distortion or flattening to affect flow adversely.



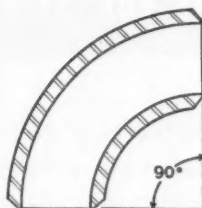
**Plain
Circumferential
Butt
Welds**

Grinnell Welding Fittings confine all welds to plain circumferential butt welds—with their inherent strength and simplicity.



Accurate Bevels

Accurate bevels aid aligning and welding. Standard straight bevel for thickness (T) $\frac{3}{16}$ to $\frac{3}{4}$ inch inclusive. Standard U-bevel for thickness (T) greater than $\frac{3}{4}$ inch.



**True
Included
Angles**

True included angles permit fabrication and erection of complicated piping systems to exact measurements.



Send for copy of this new catalog showing the complete line of Grinnell Welding Fittings and Forged Steel Flanges.

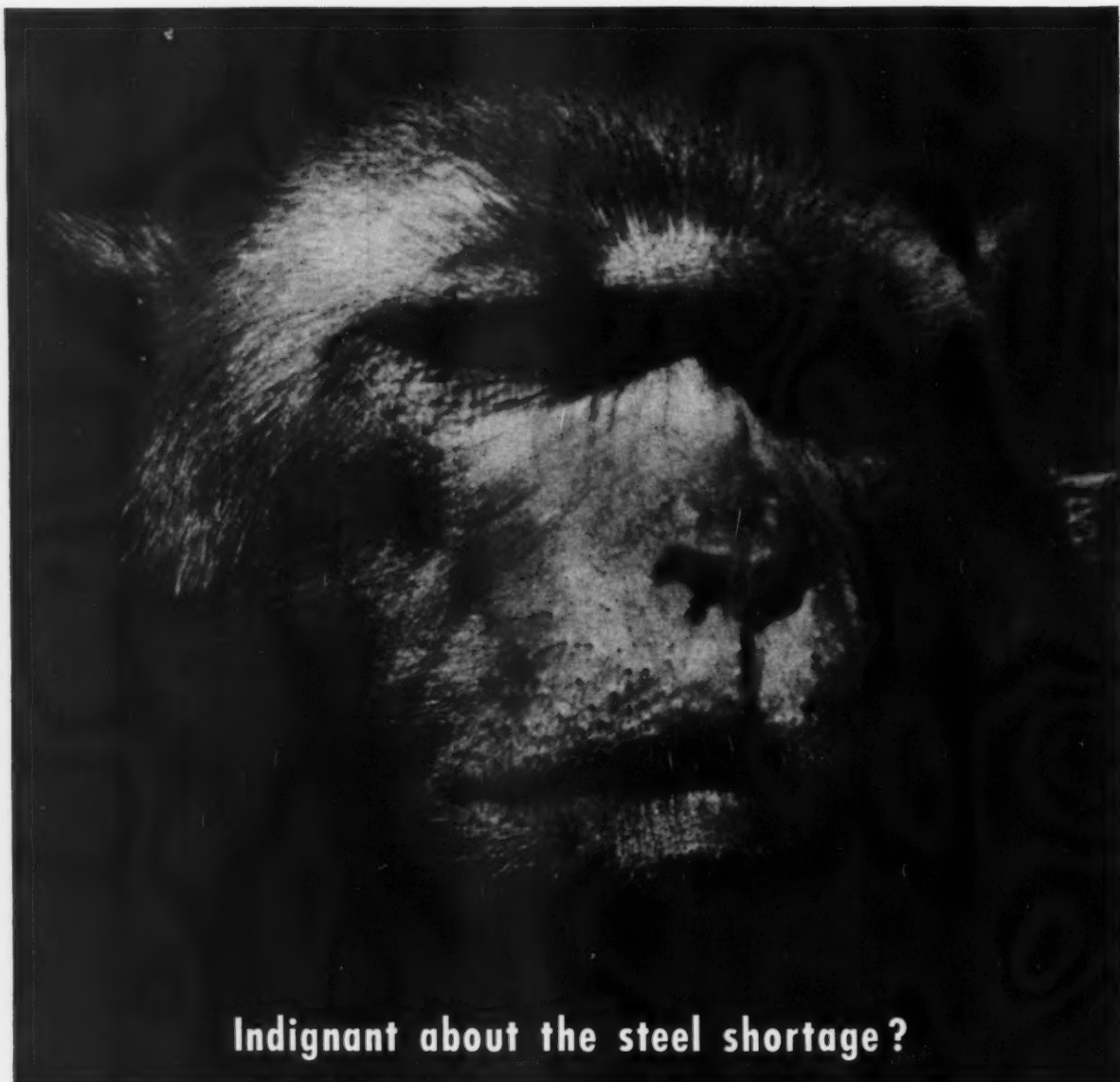
GRINNELL

WHENEVER PIPING IS INVOLVED



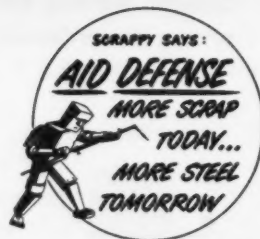
GRINNELL COMPANY OF THE PACIFIC. Sales Offices and Warehouses: Denver • Fresno • Long Beach • Los Angeles • Oakland • Pocatello • Portland • Sacramento • San Francisco • Seattle • Spokane

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
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Indignant about the steel shortage?

Let us try to help you! In the supplies of steel that are available, we can often find a type of steel that will answer your particular purpose. Call one of our salesmen the next time you are faced with a steel supply problem. Our experience and resources may furnish your solution.



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Every one of the "graduates" of these short-course service schools receives a diploma . . . tangible evidence that Wisconsin dealers servicemen have had expert factory training.

WISCONSIN Air-Cooled ENGINE 1952

Service Clinic Diploma

1951

This Certifies that _____ Technician _____ has competently completed the _____ Course in servicing _____ and has benefited from _____ he has received. He is _____ qualified to service Wisconsin engines.





Single cylinder models, 3 to 9 hp. 2-cylinder models, 9 to 13 hp. V-type 4-cylinder models, 15 to 30 hp.

WISCONSIN MOTOR CORPORATION SERVICE CLINIC INSTRUCTOR

WISCONSIN ENGINE Service Clinics Promote BETTER SERVICE FOR and FROM Your Wisconsin-Powered Equipment

Everywhere across the nation and in Canada, dealers, servicemen, salesmen and personnel of many factories using Wisconsin Power, are learning how to do a better job of servicing Wisconsin Engines powering a great variety of equipment. Over 4,000 men have attended these clinics since the first was held January 12, 1949.

Altogether, these clinics represent hundreds of hours of



Here's a typical Service Clinic in session. To bring these clinics to Wisconsin's dealers and servicemen, our factory-trained instructor has traveled 40,000 miles by air and over 50,000 miles in a specially equipped station wagon . . . covering the map from coast to coast, from the Far North to the Deep South.

practical instruction covering all of the problems that come to the attention of everyone who sells and services Wisconsin Engines. Every phase of engine servicing is covered . . . correct disassembly and assembly; short cuts in trouble shooting; preventive maintenance; parts and service methods, plus the answers to individual questions regarding engine operation, construction and specific servicing problems.

In days like these, with large backlogs of orders for defense and peace alike, Wisconsin Engine Service Clinics offer further assurance of the sound, logical judgment in specifying Wisconsin Heavy-Duty Air-Cooled Engines. A better understanding of servicing problems means better servicing for better engines . . . adding up to equipment that's powered to provide the most economical and dependable service and the longest life.

Your best interests, as a present or potential customer for Wisconsin Air-Cooled Engines, are safeguarded to the utmost.

MOST H.P. HOURS



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

pipng maintenance

costs more

now!

**You spend less on it
by using Dependable Quality**

CRANE VALVES

*... That's why
more Crane Valves
are used
than any other make*

easy to open for inspection

It's no trick to dismantle this clamp gate valve for inspection, cleaning, or servicing. Just remove two nuts and lift out the complete bonnet and disc assembly. The body stays in the line. Reassembling is just as easy. Repeated opening does not affect bonnet joint tightness or alignment.

A real time and labor saver on lines needing periodic cleanout, Crane Outside Screw and Yoke Clamp Gates are made in materials suited to a variety of services. Also Inside Screw with rising stem and Quick-Opening Patterns. Choice of flanged or screwed ends.

For complete valve suitability at lower ultimate cost, you're better off with Crane Valves. Ask your Crane Representative for demonstration.

No. 485½ Iron Body Clamp Gate

CRANE CO.

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

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836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving
All Industrial Areas*

this is the multi-mixer

a modern gas velocity control and flash-back

**this modern Multi-Mixer saves
you an initial purchase price as
well as an operating cost.**

Here is a welding torch so thoughtfully designed and so carefully manufactured that it actually gives to you greater value—lower maintenance cost, and finer operation with maximum safety.

And, here is how it does it. By better gas velocity control the National Multi-Mixer solves three important problems: 1. It permits the oxygen to join the fuel gas without causing centrifugal separation of the gas molecules; 2. It does so without creating undesirable eddies in the stream of the mixing gases; and, 3. It limits the possibility of "flash-back" by breaking up the stream of the fuel gas into numerous small passages.

The National welding torch has a single gas mixer fully able to supply the entire range of tip sizes with an adequate, perfectly mixed, flow of gases.

Like an excellent carburetor of a modern automobile, the National Multi-Mixer is fully able to meet all of the needs of an efficient welding or flame cutting torch.

It is wasteful and unnecessary to encumber your pocketbook or your torch with prima-donna mixer-nozzles, each one with but limited usefulness.

**"YOU DON'T NEED AN EGG
BEATER TO MIX GASES . . ."**

**Write for this very interesting
booklet today — it's free.**

Made by

National
SINCE 1910

WELDING EQUIPMENT CO., San Francisco 5, California

B11



P&H

OVERHEAD CRANES

Built Entirely by P&H

... Electrical Equipment Included!

P&H is America's *only* manufacturer producing complete crane units — with single manufacturing responsibility. All

P&H electric motors and controls are designed specifically for crane service. You benefit in greater operating efficiency, lower maintenance costs.

Magnetorque* AC control is a typical example of the more advanced crane design and finer performance you get from P&H's long leadership in overhead cranes. Ask about it.

Ask also about P&H Trav-Lift Cranes for intermittent service to 15 tons, and Hevi-Lift Hoists to 15 ton capacity.

*T.M. of Harnischfeger Corporation for electro-magnetic type brake



**for Western Industry—
P&H Cranes built in the West!**

Now, with the opening of P&H's new Pacific Division plant, your complete crane needs can be met in the West. Here, in addition to the manufacture of P&H Overhead Cranes, is a complete sales and services staff, experienced in all P&H Products, ready to serve you.

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HARNISCHFEGER

4604 West National Avenue
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Los Angeles 59, California

the P&H Line



POWER SHOVELS



DIESEL ENGINES



TRUCK CRANES



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OVERHEAD CRANES



ELECTRIC HOISTS



WELDING EQUIPMENT

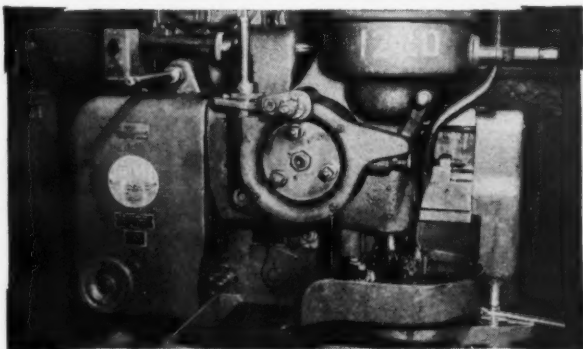


SOIL STABILIZERS

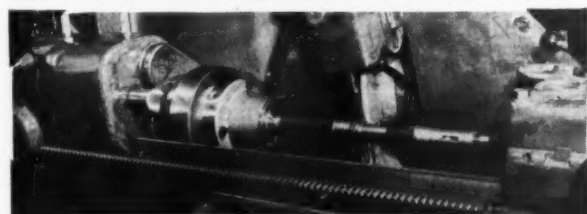
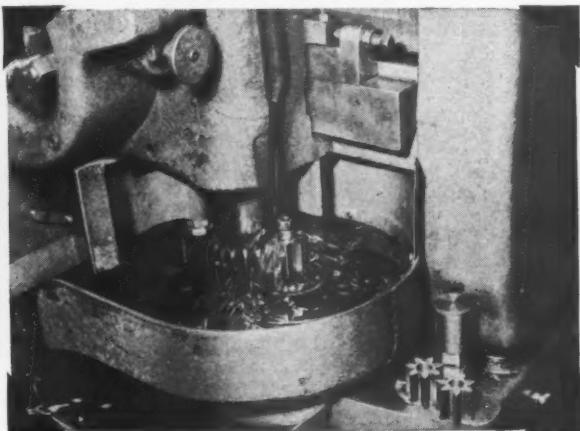
STANDARD ENGINEER'S REPORT

	DATA
LUBRICANT	Calol Cutting Oil 20-TA
TOOL	High-speed gear shaper + others
LUBRICATOR	Circulating and hand
SERVICE	Making fuel-burner and engine parts
FIRM	Iron Fireman Mfg. Co., Portland, Oregon

Calol cutting oil triples machine-tool life!



THIS HIGH-SPEED GEAR SHAPER, in the big Iron Fireman Manufacturing Co. shop at Portland, Oregon, required a new cutting tool every half day until Calol Cutting Oil 20-TA replaced the comparable type competitive lubricant being used. Now tools on the machine are only changed after 1½ days of use. "Besides three times longer tool life, I get good surface finish at high speeds with Calol Cutting Oil, and it costs me far less than the oil I was using," says Bill Huntley, Maintenance Foreman.



CALOL CUTTING OILS are used in all the many machining operations in Iron Fireman's shop. This includes thread grinding (shown here), shaping, hobbing, drilling, turning and broaching. There is a complete line of Calol Cutting and Soluble Oils to meet every machining condition. They come in four general types: Mineral oils, ready-mixed compounded oils, concentrates and soluble oils.



FREE CATALOG: "How to Save Money on Equipment Operation," a new booklet full of valuable information, is ready for you. Write or ask for your free copy today.

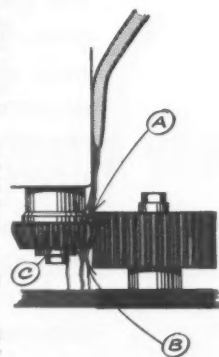
TRADEMARK "CALOL" REG. U.S. PAT. OFF.



How to increase efficiency in all metal-cutting operations

Use the correct Calol Cutting Fluid for any operation from grinding to broaching. Recommendations for each are made from actual working results.

- Have high cooling and lubricating qualities—minimize "built-up edge" and promote good finish.
- Flush away cuttings readily.
- Protect machine and work against rusting and corrosion.



STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA



A Big Lift!

We get a "big lift" in being given the opportunity to put to work the experience we have accumulated over a period of more than eighty years of service to America's shippers.

There's a satisfaction in having the know-how, the equipment and facilities to handle any shipping job efficiently whether it involves a carton or carload . . . or has to do with a prob-

lem of proper packaging and loading.

If we can be of assistance to you . . . can give you a lift in any situation pertaining to freight transportation . . . we'll be very glad to be of service.

• • •

Need passenger reservations? All departments of Union Pacific work closely together. The representative you know will be glad to help you with your travel plans.

Be Specific - Ship "Union Pacific"

(Offices in 70 cities throughout the U. S. A.)



Freeways... overpasses... bridges... it takes a lot of steel to build vital highways. In the past two years, steel has helped build 7,000 miles of highways in the West—enough to cross the nation twice!

It takes lots of steel to keep your car rolling!

West's roads take thousands of tons of steel a year

You don't usually think of highways needing steel. Yet the fact is that thousands of tons of steel have gone into 7,000 miles of western highways in the past two years. Steel for reinforcing concrete, steel for building overpasses and bridges, steel for the

construction equipment needed to do the job. Yes, steel plays a big part in western highways. And a large part of this steel comes from Columbia-Geneva Steel, western producing member of U. S. Steel—the industrial family that serves the nation.

West's largest source of steel



Columbia-Geneva Steel Division

United States Steel Company



UNITED STATES STEEL

EDITORIAL COMMENT

Things Unforeseen

DID ANYONE on January 1, 1942 foresee that within the ten years to follow the West's population would increase more than six million?

Did anyone foresee that the West would find in this period that heavy industry had arrived to stay? That industrial operations of all kinds to serve vastly increased demands of the area would flourish? That scores, if not hundreds of Eastern manufacturers would find the time had come to establish branch plants out here instead of attempting to serve the West from a distance? That numbers of "native" industries in the West would expand to a nation-wide basis?

Well, hardly! Such a vision was beyond the grasp of anyone at that time. Yet it all came true, and today the danger is that too few of us recognize the present decade as one destined to experience a growth equally as great. Some say it cannot be as spectacular; others believe it will be even more so.

It is easy to overlook the cumulative effect of growth. When one new industry arrives, or an existing one expands, it requires services and supplies from others. When the level reaches a certain height, enterprises hitherto economically unjustified become feasible, and so on.

Unquestionably the current defense program with its tremendous investment in new industrial facilities will repeat the impact of World War II in accelerating industrial development. We need to lift our sights, all of us, and rise to our opportunities and our responsibilities.

Tenth Birthday

THE 1952 Review and Forecast Number may well be called *Western Industry's* tenth birthday in the full-sized magazine field. Before 1942 it had been published in pocket-size form for a couple of years or so, but in the January number of 1942 it put on long pants, albeit of very small dimensions.

In this momentous decade which now lies behind the West, *Western Industry* also was going through its growing pains. It was learning by the trial and error method what were the fundamental trends and developments on which worth-while editorial material could be based, reporting the outstanding events of the wartime and immediate post-war periods and evaluating and interpreting them wherever possible. Through it all, the common economic interests of the West were repeatedly stressed, with gratifying responses from our readers.

Simultaneously with these experiences, the magazine was expanding its size, its coverage, its contacts and its grasp of the field. It has struck out into new fields of editorial enterprise, and we feel justified in saying that *Western Industry* has helped in appreciable measure to shape the industrial course of the West. For all the editorial, circulation and advertising support we have received, we hereby give thanks.

Looking to the future, we see increasing opportunities to be of service to industry in the West, and our readers may rest assured that we will do our best to take advantage of them.

CALENDAR OF MEETINGS

Jan. 26—One-day course on problems of human relations in safety and supervision, sponsored by Pacific Northwest chapters of ASSE, in Seattle, University of Washington campus. Registration fee of \$7.50 includes 40-page booklet of course notes. Contact Russel H. Pohl, c/o Mine Safety Appliance Co., 71 Columbia St., Seattle, Wash.

Jan. 28—Opening of two-week instructional course of Merchants and Manufacturers Association Trainers' Institute on campus of Los Angeles City College, Los Angeles. Contact Bryant Essick, 725 S. Spring St., Los Angeles 14, Calif.

Jan. 30—One-day course on problems of human relations in safety and supervision, sponsored by Pacific Northwest chapters of ASSE, in Portland, at Masonic Temple, 1119 S.W. Park Ave. Registration fee of \$7.50 includes 40-page booklet of course notes. Contact George Lewis, c/o Timber Structures, Inc., 3400 N.W. Yeon Ave., Portland, Ore.

Jan. 31-Feb. 1—Clay Industries Conference, at University of California campus, Berkeley, Calif. Contact Joseph A. Pask, Associate Professor of Ceramic Engineering, Division of Mineral Technology, University of California, Berkeley, Calif.

Jan. 31, Feb. 1-2, 1952—Colorado Mining Association 1952 Mining Convention at Shirley Savoy Hotel, Denver, Colorado. Contact Thelma Abel, Secretary, Colorado Mining Association, 204 State Office Bldg., Denver 2, Colorado.

Feb. 1-2—Fourth annual Industrial Engineering Institute, University of California, Berkeley. Contact Earl Jones, Engineering Extension.

Feb. 4-5—Clay Industries Conference, at University of California at Los Angeles campus, Los Angeles, Calif. Contact Professor W. J. Knapp, UCLA, Los Angeles, Calif.

Feb. 4-5—Fourth annual Industrial Engineering Institute, University of California, Los Angeles. Contact J. C. Dillon, Engineering Extension.

Feb. 4-14—Economic Mobilization Course conducted by Industrial College of the Armed Forces, at Municipal Auditorium Theater, Oakland, Calif. Sponsors are Oakland Chamber of Commerce, Fourth Air Force, Sixth Army, and 12th Naval District. Contact Harry Lange, vice president, Cutter Laboratories, 4th and Parker Sts., Berkeley, Calif.

Feb. 5-8. Amn. Society of Sugar Beet Technicians, Hotel Utah, Salt Lake City. Contact James H. Fischer, Box 531, Fort Collins, Colo.

Feb. 6-8—Transportation and Traffic Engineering Institute, in Los Angeles. Contact Bob Glenn, Bldg. T-7, University of California, Berkeley 4, Calif.

More "CALENDAR" on page 30



Whatacrafta

**COLSON
CASTERS**

1834 DIFFERENT STYLES, sizes and prices
all stocked in California and shipped by engineers.
There is no need to design special casters
for your equipment when Colson can meet your
requirements, usually, from stock.

...AND COLSON TRUCKS
A COMPLETE LINE of 188 types of hand trucks
and equipment unmatched in California.

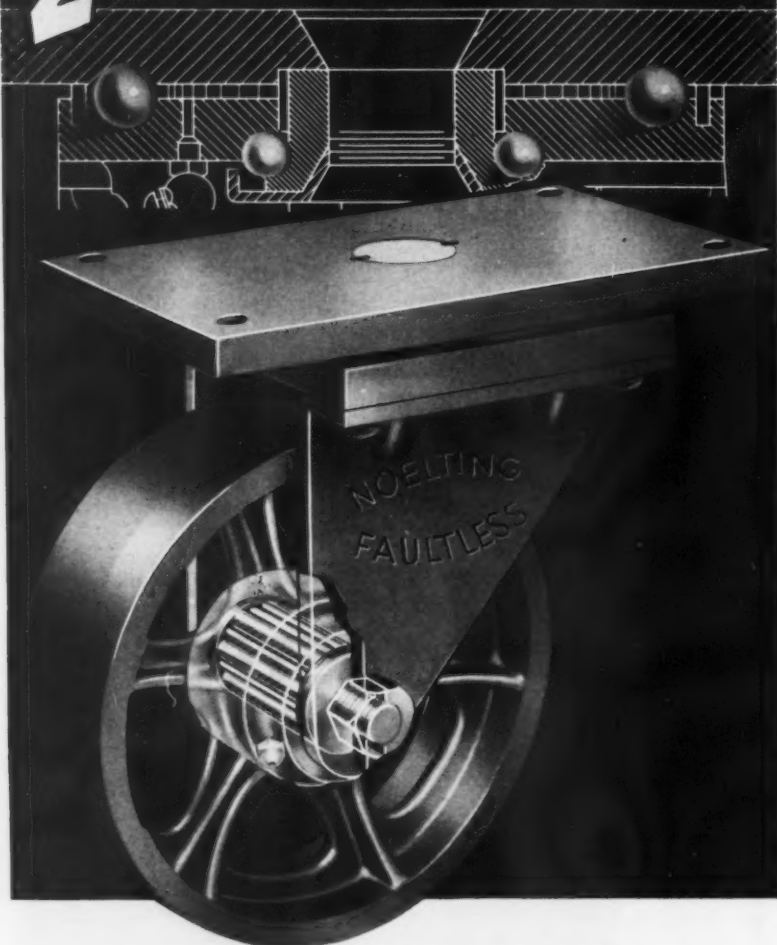
Colson Equipment & Supply Co.

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OAKLAND 7, 220 Ninth Street, HOphomore 5-1154

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CUT MAN-HOURS and HANDLING COSTS

Series H-300 Engineered Casters release manpower for more productive jobs. Faultless equipped production lines cut sharply into direct labor wherever materials are moved.

Faultless

INDUSTRIAL CASTERS

SAVE COSTS 3 WAYS



1. PRODUCTION Higher production costs demand new short cuts. Faultless Casters speed up the flow of materials.



2. MAN-HOURS Cut handling time, accounting for over 20% of industry's man-hours.

3. FLOORS No need for costly floor alterations or floor covering—Faultless wheels are available for all types of floor surfaces and loads.

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Pacific coast office and warehouse: 1252 So. Boyle Ave., Los Angeles 23, California.

Stocks carried for immediate delivery.

CALENDAR OF MEETINGS

Begins on page 28

Jan. 31—American Society of Agricultural Engineers, Pacific Coast Section, at Davis, Calif. Contact Walter W. Weir, 320 Hilgard Hall, University of California, Berkeley 4, Calif.

Spring 1952—Production American Petroleum Institute, Rocky Mountain Division, in Casper, Wyoming. Contact C. H. Griffin, Casper, Wyo.

March 6-7—Western Candy Conference at Fairmont Hotel, San Francisco. Contact Clarence Kretchner, American Licorice Company, 55 Federal St., San Francisco, Calif.

March 16-18—Canners League of California, 1952 Annual Directors Meeting, at Santa Barbara Biltmore, Santa Barbara, California. Contact M. A. Clevenger, Executive Vice President, Canners League of California, 64 Pine St., San Francisco, GAfield 1-3791.

March 20-22—Electrical Maintenance Engineers Association of Southern California, Industrial Electrical Show and Technical Conference, Culver City Memorial Auditorium. Contact Richard Rogers, chairman, 1952 Electrical Show, c/o EMEA, 511 Architects' Bldg., 816 West Fifth St., Los Angeles 17, Calif.

March 24-27—American Association of Petroleum Geologists convention, in Los Angeles. Contact J. P. D. Hull, business manager, Box 979, Tulsa 1, Oklahoma.

March 31-April 2—Intermountain Logging Conference, in Spokane. Contact Charles P. Keim, Buffalo Bldg., Kalispell, Montana.

April 1-2—Seventh annual meeting of Northwest Wood Products Clinic, at Davenport Hotel, Spokane, Wash. Contact R. O. Batdorf, P. O. Box 684, Spokane, Wash.

April 4-5—Annual meeting of Western Highway Institute, 11 Western States research and coordination agency for the motor carriers, at Palm Springs. Contact Western Highway Institute, 417 Market St., San Francisco.

April 4-5—California Industrial Education Association conference, in Oakland, California. Contact Mrs. Eleanor Hewlett, Laney Trade School, 240 E. 10th St., Oakland, Calif.

April 15-16—27th Pacific Coast Management Conference, at Claremont Hotel, Berkeley, Calif. Contact Everett Van Every, secretary-manager, California Personnel Management Assn., Farm Credit Bldg., Berkeley 4, Calif.

April 28—Northwest Public Power Assn. exhibit at Olympia Hotel, Seattle. Contact Gus Norwood, 1311 Columbia St., Vancouver, Wash.

May—California Society of Professional Engineers convention, in Los Angeles. Contact A. C. Bullen, 1070 Los Flores Drive, Del Rosa, Calif.

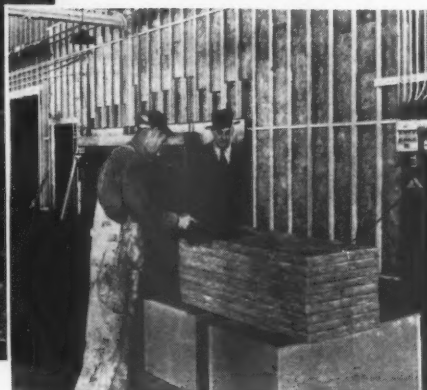


LEFT:

Port of Tacoma Cold Storage Plant
—535,000 bd. ft. of Fiberglas AE
(Asphalt Enclosed) Board Insulation.

BELOW:

Calava Growers Pre-Cooling Plant,
Escondido, Calif. Fiberglas PF (Pre-
formed) Insulation on walls and
ceiling.



Low Temperatures... AT LOW COSTS!

FIBERGLAS* LOW TEMPERATURE INSULATIONS have exceptionally low thermal conductivity and possess life-of-the-building permanency. Their use means dollars in your pocket—dollars saved in material, application and maintenance costs—as well as in cost of power required to maintain chilling, holding or processing rooms at low temperatures.

Asphalt adhered **Type-AE (Asphalt Enclosed) Board**—and mechanically applied **Type-PF (Pre-formed) Insulation** have a proved record of unsurpassed service for efficient insulation of walls, partitions and ceilings in low temperature structures.

Ideal for the Job—highly moisture resistant Fiberglas Insulations behave better under possible dampness—won't spall or disintegrate if inner wall frost develops. They will neither pro-

duce nor pick up odors in service. The ageless fibers of glass cannot rot, decay, support mold or fungus growth, and will not provide sustenance for vermin or rodents.

Installation Costs Are Low—Fiberglas Low Temperature Insulations are light in weight, structurally sound, easy to cut and apply by standard erection practices. Competent Fiberglas applicators do first rate engineering and application on all types of jobs.

For name of your local applicator and a copy of the informative data book, "Insulation of Low Temperature Structures", phone the FIBERGLAS branch nearest you OR write to OWENS-CORNING FIBERGLAS CORPORATION, Box 113-A, Santa Clara, California.

PACIFIC COAST DIVISION SALES OFFICES: Albuquerque, Denver, El Paso, Eugene, Fresno, Los Angeles, Phoenix, Portland, Sacramento, Salt Lake City, San Diego, San Francisco, San Jose, Seattle.

*Pacific Coast
Division of*

OWENS-CORNING
FIBERGLAS

SANTA CLARA, CALIFORNIA



*Fiberglas is the trade-mark (Reg. U. S. Pat. Off.) of the Owens-Corning Fiberglas Corporation for a variety of products made of or with fibers of glass.

To Management:

We suggest you bring this page to the attention of your Purchasing, Production and Maintenance Depts. One or more of its paragraphs may lead to the solution of critical procurement problems in your plant.

Stymied by Steel Shortages? These 6 Suggestions May Help!

- ① **Handicapped by restrictions on nickel-bearing 18-8 stainless?** If you are, straight chrome stainless may enable you to continue your stainless production. For instance, type 430—the most widely used straight chrome steel—can often be substituted for type 302 in applications subject to mild corrosion. Ryerson offers you the largest and most diversified stocks of straight chrome stainless including types 405 and 430 sheets, type 430 plates and type 416 bars.
- ② **Manufacturers plagued by seamless tubing scarcities** will find that bright-finish, hot rolled welded tubes in 11 gauge and $\frac{3}{16}$ " walls can often be used as an alternate for seamless tubes in the same sizes. These welded tubes are in good supply at Ryerson in a wide range of round and square sizes.
- ③ **If you are having trouble adopting interim and lean alloys** because of the unfamiliar analyses of these new steels, let Ryerson metallurgists work with you. We test all alloys and can assure the hardenability desired. Heat treatment guide with every shipment.
- ④ **Faced with the problem of finding workable substitutes for special plate shapes?** You may find the right answer in forgings. You can get complete information on forgings from our sales representative.
- ⑤ **In addition to these alternate steels** we recommend a superior babbitt—Glyco Babbitt Metal—instead of more expensive and restricted high tin babbitt. Product of an exclusive Ryerson formula, Glyco is a lead base alloy with physicals equal to tin base types.
- ⑥ **And, remember**—please give us full information when ordering. For instance, when we know the exact size or length multiple—the cut size or length you will actually use—we may be able to fill your order from smaller pieces or "shorts." Knowledge of acceptable alternates also helps. But, no matter what your requirements, we urge you to check with us. We will always work closely with you—help you get what you need.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC.

LOS ANGELES PLANT: Box 3817, Los Angeles 54. Plant: 4310 E. Bandini Blvd. Phone: ANgelus 2-6141. From San Diego (No toll) Phone: ZEnith 6660.
SAN FRANCISCO PLANT: Box 188, Emeryville. Plant: 65th & Hollis Sts. Phones: OlymPic 3-2933, ENterprise 10176.



ANNUAL REVIEW and FORECAST

SEE FOR YOURSELF

what makes the West tick. To help you feel the pulse of the nation's fastest growing section, this annual report is provided. It gives you an over-all, comprehensive view of the vitals in

TODAY'S INDUSTRIAL WEST.

No other periodic study and detailed compilation of this kind exists. You can use it profitably to guide your industrial course for the future.



HERE'S THE PICTURE of the nation's soundest industrial area

Western conditions, developments, trends, differ widely from those in other parts of the nation. Whether you regard the West as a single economic entity or as a group of areas, this holds true. Hence, a distinctly Western approach to our industrial economy is most essential. That is our effort in this, our fourth Annual Review and Forecast issue of *Western Industry*.

The entire editorial content of the issue, except for the usual departments, is devoted to reports on individual industries as well as the over-all Western picture.

THE WEST has reached another significant milestone in its industrial history with the arrival of the year 1952.

Behind it lies a postwar period which demonstrated that the West has an industrial soundness less subject to recession than any other area of the nation. Evidence which has only become available within the last few weeks brings this situation to light.

Before it stretches a decade in which a new industrial foundation is being laid for an accelerated expansion of its economy comparable in a measure to the wartime and postwar growth of the last decade which already has been so well publicized.

The evidence of Western soundness

is the Census Bureau's annual Survey of Manufactures, which reveals that from 1947 to 1950 the West made a greater gain in industrial employment than any other part of the country. An accompanying table and chart tell the story.

Actually the two most important industrial areas of the country, the East (New England and Middle Atlantic states) and the North (Great Lakes and Prairie states), both with far more population and industry than the West, showed a net loss in industrial employment for the three-year period.

The only other area besides the West to move upward was the South (the belt below the Mason and Dixon line west through Oklahoma and

Texas), and its 16 states plus the District of Columbia, failed to equal the gain shown by the West's eleven states.

Defense contracts since 1950 can easily have taken up the slack in the North and East since 1950 and outrun the West's earlier gain. But the 1947-1950 situation clearly indicates that the West has some strong sustaining factor which counteracts other tendencies for employment to lag.

This factor is evidently the continuing rapid influx of population which promises to keep on indefinitely. Whether all of the incoming people have jobs immediately awaiting them on arrival or not, the swelling tide of itself creates jobs in the industries which provide the food, shelter, light, heat, schools, streets, sewers, water, transportation and other things required by this increasing population.

The new industrial foundation for the future consists of around a billion dollars in plants and facilities for defense contracts already authorized by the government, with unquestionably much more to come. The figures in the

accompanying table for certificates of necessity permitting accelerated depreciation, do not represent the total investment, because in a number of cases the amount involved was withheld for security reasons.

Just as most of the World War II facilities were put to postwar civilian use, it is to be expected that the new installations will play an important part in the future economy.

A summary published in *Western Industry* in April 1945 shows a total of 2½ billion dollars invested between July 1, 1940 and June 30, 1944. This does not include another half-billion for the Hanford plutonium plant. The leading items were as follows:

1. Ship construction and repair.....	\$ 614
2. Non-ferrous metals, basic and semi-finished.....	448
3. Chemicals, coal and petroleum products.....	405
4. Iron and steel—basic and semi-finished.....	388
5. Aircraft engines and parts.....	300
6. Guns and ammunition.....	157
7. Food processing and other manufacturing.....	115

The largest item in the World War II tabulation, of ship construction and repair, an investment which practically had to be wiped off the books in toto, does not appear at all in the current program. Instead, steel has jumped into the lead, eloquent testimony to further growth in the West of heavy industry in many ramifications. It appears likely that additional steel expansion beyond the present authorizations will develop in the near future.

Perhaps the most serious problem the steel industry in the West faces is scrap supply which is being gradually eaten up. The deficiency can be overcome by building blast furnaces, but these are costly. Iron ore resources are adequate for many years.

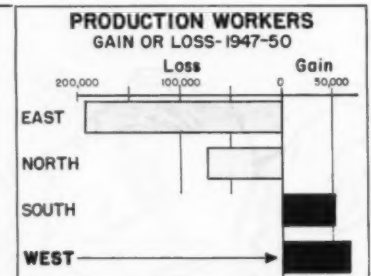
Petroleum ranks second in the present program, significant of the increased importance of aircraft as a means of transportation, and also of the growing status of the guided missile program. The fact that the certificates of necessity for aircraft seem to play almost a minor role compared to some other items may be accounted

THE WEST LEADS

in postwar manufacturing
employment gains (1947-1950)

while the East and North suffer losses—

(From Annual Survey of Manufactures, U. S. Census Bureau)



Production Workers	East‡	North‡	South‡	West‡	Montana	Idaho	Wyoming	Colorado
Production Workers, 1950.....	4,300,481	4,128,737	2,409,564	927,274	13,614	14,562	6,083	42,959
Production Workers, 1949.....	4,075,948	3,829,060	2,263,274	848,119	13,457	13,901	5,152	38,897
Production Workers, 1947.....	4,494,204	4,201,112	2,358,758	862,114	13,606	14,602	4,285	44,153
Gain, 1949-1950.....	+ 224,533	+ 299,677	+ 146,290	+ 79,155	+ 157	+ 661	+ 931	+ 4,062
Gain, 1947-1949.....	- 418,256	- 372,052	- 95,484	- 13,995	- 149	- 701	- 5,256	- 5,256
Gain, 1947-1950.....	- 193,723	- 72,375	+ 50,766	+ 65,160	+ 8	+ 40	+ 1,798	+ 1,194
Value Added by Mfr., 1950.....	\$ 30,909,685	\$ 34,942,833	\$ 15,779,913	\$ 8,083,348	107,837	118,675	37,739	340,795
Value Added by Mfr., 1949.....	\$ 26,975,278	\$ 28,896,846	\$ 12,983,735	\$ 6,510,668	82,180	91,702	29,513	278,626
Value Added by Mfr., 1947.....	\$ 27,604,426	\$ 27,592,409	\$ 12,845,191	\$ 6,383,236	92,258	109,694	34,957	286,774
Gain, 1949-1950.....	\$ + 3,934,407	\$ + 6,045,987	\$ + 2,796,178	\$ + 1,572,680	+ 25,687	+ 26,973	+ 8,226	+ 62,169
Gain, 1947-1949.....	\$ - 629,148	\$ + 1,304,437	\$ + 138,544	\$ + 127,432	- 10,078	- 17,992	- 5,444	- 8,148
Gain, 1947-1950.....	\$ + 3,305,259	\$ + 7,330,424	\$ + 2,934,722	\$ + 1,700,112	+ 15,579	+ 8,981	+ 2,982	+ 54,021

Production Workers	New Mexico	Arizona	Utah	Nevada	Washington	Oregon	California
Production Workers, 1950.....	10,755	11,470	21,868	1,498	133,809	101,997	568,659
Production Workers, 1949.....	7,794	10,229	22,849	2,148	129,746	96,634	507,312
Production Workers, 1947.....	6,349	11,167	19,973	2,064	123,488	92,144	530,283
Gain, 1949-1950.....	+ 2,961	+ 1,241	- 981	+ 650	+ 4,063	+ 5,363	+ 61,312
Gain, 1947-1949.....	+ 445	- 938	+ 2,876	+ 84	+ 6,258	+ 4,490	- 22,971
Gain, 1947-1950.....	+ 4,406	+ 303	+ 1,895	- 566	+ 10,321	+ 9,853	+ 38,376
Value Added by Mfr., 1950.....	\$ 102,897	\$ 127,946	\$ 177,504	\$ 28,670	\$ 1,113,362	\$ 806,947	\$ 5,120,976
Value Added by Mfr., 1949.....	\$ 51,694	\$ 91,681	\$ 138,268	\$ 19,204	\$ 926,630	\$ 633,136	\$ 4,168,034
Value Added by Mfr., 1947.....	\$ 55,486	\$ 103,958	\$ 128,298	\$ 27,777	\$ 874,036	\$ 675,017	\$ 3,994,981
Gain, 1949-1950.....	\$ + 51,203	\$ + 36,265	\$ + 39,236	\$ + 9,466	\$ + 186,732	\$ + 173,811	\$ + 952,942
Gain, 1947-1949.....	\$ - 3,792	\$ 12,277	\$ + 9,970	\$ + 8,573	\$ + 52,594	\$ - 41,881	\$ + 173,053
Gain, 1947-1950.....	\$ + 47,411	\$ + 23,988	\$ + 49,206	\$ + 873	\$ + 239,326	\$ + 131,930	\$ + 1,125,995

‡ East: New England, New York, N. J., Pa.

North: Ohio, Ind., Ill., Mich., Wis., N. Dak., S. Dak., Iowa, Mo., Neb., Kans.

South: Del., Md., Dist. of Col., Va., W. Va., N. C., S. C., Ga., Fla., Ky., Tenn., Ala., Miss., Ark., La., Okla., Texas.

for as follows: first, that some of the cases where the amount of the certificate was withheld were for aircraft facilities; second, that the aircraft plants were already sufficiently well equipped as not to require great expansion; third, that the big expansion, if any, will come later.

One well-informed observer feels that as the procurement of guided missiles increases, the requirements for aircraft production will decrease in a measurable proportion. Not much is being said about the missile program, but it is well known that southern California is the center of most of the development work and a large part of the production.

Because southern California is the largest single area of aircraft and parts production and is somewhat similarly situated as to guided missiles, while in electronics the San Francisco peninsula is highly important in the national picture, the result is the building up of a significant pool of technical knowledge and craftsmanship skill along the Coast which may easily have great bearing on future industrial development in the West.

Assets Are Mental

An interesting comparison could be made with the petroleum industry, of which it has been said that its real assets are not the oil under the ground, but the knowledge in the heads of its technical men. The development of small engines in the West, described in some detail in the next article in this issue, may be cited as exemplifying what may be expected to grow out of the above-mentioned "brain pool."

Overall industrial expansion in the West for 1951 topped all previous levels, judging by reports from the San Francisco and Los Angeles chambers of commerce. They are as follows:

Northern California (48 counties)

	Number of new industries	Number of expansions	Total investment
1951 (10 mo.)....	94	370	\$150,662,782
1950	151	408	117,852,877
1947 (prev. high) 478	326	127,565,903	

Southern California (Los Angeles County only)

1951 (11 mo.)....	107	427	\$300,031,927
1950	128	399	98,397,250
1943 (prev. high) 151	340	161,953,996	

Total for State

1951 (incomplete)....	201	797	\$450,694,709
1950	279	807	216,250,127

For the Portland metropolitan area, the Portland Chamber of Commerce reports \$29,500,000 invested in new industries and expansions. The new industries number 55.

It was feared a year ago that there would be a disastrous sag in 1951 in the West's housing programs, on which



West has still greater peaks ahead. Prepare to scale them!

much Western industrial activity hinges, but the accompanying Federal Reserve Board chart shows the decline from 1950 was not too great and that the level is still above most of 1949. Evidently the anticipated shortage of materials did not develop, and credit restrictions were offset by continued high incomes. In 1950 the West, as the largest single home-building area in the country, accounted for more than 28 per cent of the national total.

FHA commitment figures for the first ten months of 1951 in the eleven Western States, as reported by the Housing and Home Finance Agency, cover 85,087 dwelling units and amount to \$641,626,079. Of this total, new construction accounted for 48,554 dwelling units involving \$365,736,495, and existing construction represented \$275,889,584. Housing for civilian employees at military projects in the Sixth

Army area, authorized under the Wherry Act, includes 1,833 dwelling units in California and Utah.

Federal spending is being hastened by electric power shortages, particularly in the Pacific Northwest. For the fiscal year ending June 30, 1952 appropriations for multi-purpose projects by the Bureau of Reclamation and the Army Engineers total \$344,544,667. Figures on private projects are not so readily available.

Employment and Income Up

Manufacturing employment generally continued at high levels, preliminary figures for October 1951 being 100,000 above a year ago. The West is participating to about the same degree as the rest of the United States in the upward income swing, advancing in 1950 by 11.4 per cent over 1949 in total income and 9.1 per cent in per capita income, according to the 1950 income payment figures recently released by the Department of Commerce.

Per capita income in the West is still well above the national average, though the margin is narrowing. Since 1946, national per capita income has increased from \$1,211 to \$1,436, or 19 per cent, while in the Western States it has risen 18 per cent, from \$1,368 to \$1,615.

In the West a larger proportion of income is derived from agriculture, government, trade and services than for the United States as a whole, but the proportion of its income from manufacturing payrolls is less. It has gained since 1940, but not as rapidly as the country as a whole. A compar-

MILITARY PRIME CONTRACT AWARDS

Fiscal Year 1951—In Thousands of Dollars
Source: Munitions Board

	Amount	Per Cent of Natl. Total
Arizona	\$ 51,961	0.2
California	3,899,450	13.2
Colorado	64,838	0.2
Idaho	13,919	0.1
Montana	9,777	....
Nevada	2,019	....
New Mexico	33,827	0.1
Oregon	98,825	0.3
Utah	32,869	0.1
Washington	638,944	2.2
Total	\$4,846,429	14.4

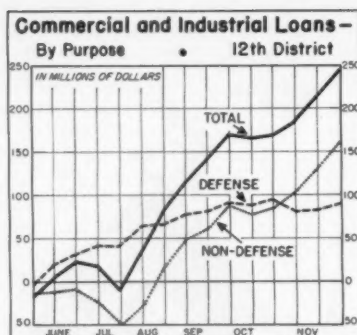
ison of major income components as a per cent of all income payments, made by Robert R. Dockson, economist for the Western Home Office of Prudential Life Insurance Company, is as follows:

	1940	1950
Agricultural Income		
U. S.	7.2	7.5
Eleven Western States.....	9.0	9.1
Government Income Payments		
U. S.	14.5	16.2
Eleven Western States.....	17.1	19.1
Manufacturing Payrolls		
U. S.	20.3	22.6
Eleven Western States.....	12.2	14.2
Trade and Service Income		
U. S.	25.5	26.3
Eleven Western States.....	28.2	28.0

Looking at the West in perspective, it becomes increasingly obvious that California, with its rank of second in population among all the states of the country, is not only the manufacturing center of the West, but also is a vast and expanding consuming market, which other states in the West can serve with increasing profitableness.

The two other Coast states, Oregon and Washington, have also grown greatly, and their dominant occupation, the forest products industries, is becoming increasingly diversified. Where lumber itself once dwarfed everything else, now plywood and pulp and paper are rapidly rising to great stature. Hardboard also is a growing youngster, and other products may follow.

Cheap hydro-electric power has been considered a big industrial drawing



The Flow of Capital in 1951

(From Federal Reserve Bank)

card for the Pacific Northwest. Actually, however, the situation has been reversed, because the electro-process industries, mainly aluminum, are using so much power that the utilities have had to refuse other business. Apparently this discouraging condition will have to continue until the completion of new hydro projects, two or three years hence.

But the big obstacle to rapid industrialization of the Northwest area seems to be really lack of cheap fuel, and this may change at any time. The oil fields of the eastern slope of the Continental Divide are being looked to as a future source of supply to augment California's production, and piping oil from Montana across the mountains into the lower Columbia River area is being discussed.

Another possibility is a refinery in the same area, which could be served

either by pipeline or by tanker from California. It would cost \$100,000,000 and it does not seem as immediate a prospect as the pipeline itself.

Natural gas imported from Canada into the Northwest, for which several applications are pending before the Alberta authorities, would probably have an average delivered cost of between 32 cents and 35 cents per Mcf. This would supplement and compete with oil, insuring low industrial fuel costs.

Industrialization of the Mountain States continues, with Colorado making some good gains and Arizona benefitting from the expansion of some southern California aircraft industries into that state. Part of Arizona's contracts resulted from compiling information on all its facilities, skills and labor supply, thereby making it easier for prime contractors to give Arizona firms subcontracts.

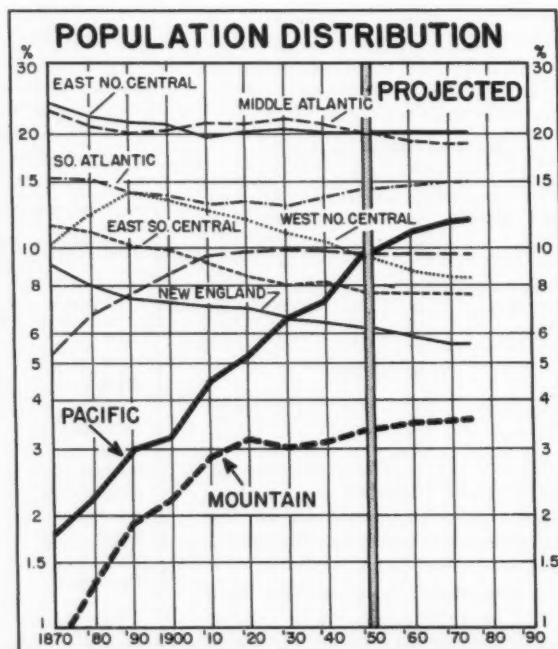
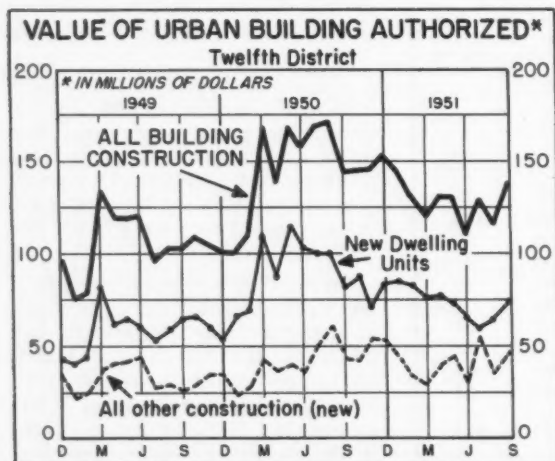
Lack of water in sufficient quantities for processing requirements has been one of the handicaps to industrial development in many parts of the West. Startling achievements at the Fontana steel mill, in reducing water consumption per tons of steel manufactured hint at new possibilities for the West in overcoming this obstacle.

Increasing interdependence between Western areas is to be found. One interesting example is that of foundries in the Salt Lake area, who have been reaching beyond their primary market of Utah and surrounding states into Montana and New Mexico, and increasing their shipments to Colorado.

Two Signposts of Western Trends

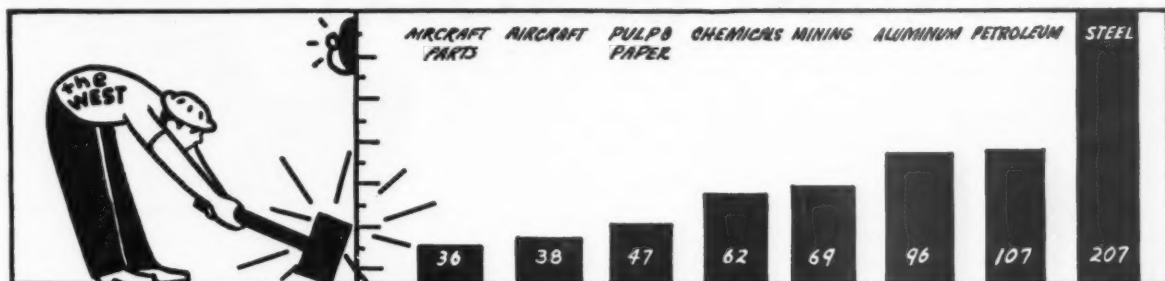
RIGHT: U. S. Dept. of Agriculture forecasts that the West is on its way to becoming the nation's most populous area.

BELOW: Federal Reserve Bank shows that the West's steadily increasing population continues to call for more housing.



New Strength Added to the West's Industrial Structure by Defense Program

Tabulation below summarizes new industrial facilities in the West covered by certificates of necessity granting accelerated depreciation issued from July 1, 1951 to Dec. 1, 1951. (Chart figures in millions.)



	California	Oregon	Washington	Montana	Idaho	Wyoming
Aircraft	\$ 24,608,881		\$ 13,693,249			
Aircraft Parts	33,122,313		816,161			
Aluminum	400,000	475,450	20,532,256	\$ 47,900,000		
Asphalt			1,000,000			
Cement	9,012,637					
Chemicals	19,320,294	1,497,598	10,983,464		\$ 16,450,000	\$ 3,164,000
Cotton	7,373,871					
Electric Power		26,938,091		5,410,000		
Electronics	3,597,550					
Food Products	2,473,141	35,325				
Food Storage	1,240,350					
Lumber	310,322	3,403,000				
Mining						
Miscellaneous Items	1,918,346	94,278	49,740		39,834	
Miscellaneous Metal Products	9,115,401		752,308			
Ordnance	5,722,300					
Paper Products	7,143,401		1,021,222			
Petroleum	106,324,105	85,100	85,400		223,000	
Pipe	12,980,027					
Plastics	116,089					
Plywood		1,399,581	619,523			
Pulp and Paper			32,029,377			
Refractories	3,947,485					
Rubber	6,691,411					
Scrap Metal	196,124	268,390	323,588			
Steel	120,416,078	358,870	1,545,000			
Towboats, Barges, Lighters	1,745,501					
TOTALS	\$377,775,627	\$ 34,555,683	\$ 83,451,288	\$ 53,310,000	\$ 16,712,834	\$ 3,164,000

	Colorado	New Mexico	Arizona	Utah	Nevada	Total
Aircraft	\$ 1,875		\$ 25,011			\$ 38,329,016
Aircraft Parts			2,528,312			36,466,786
Aluminum						69,307,706
Asphalt						1,000,000
Cement			2,945,785			11,958,422
Chemicals		\$ 1,498,000	45,000	\$ 8,973,109	\$ 189,519	62,120,984
Cotton			2,576,361			9,950,232
Electric Power			117,000			32,465,091
Electronics						3,597,550
Food Products						2,508,466
Food Storage	766,500					2,006,850
Lumber						3,713,322
Mining	10,961,483		12,326,805	843,699	42,840,758	66,972,745
Miscellaneous Items	241,484		48,500			2,392,182
Miscellaneous Metal Products	144,625		470,394			10,482,728
Ordnance	157,170		7,289,000			13,168,470
Paper Products						8,164,623
Petroleum		84,095		1,092,700		107,894,400
Pipe						12,980,027
Plastics						116,089
Plywood						2,019,104
Pulp and Paper			15,481,201			* 84,174,078
Refractories				86,890	2,126,400	6,160,775
Rubber	658,653					7,350,064
Scrap Metal	65,501		133,988			987,591
Steel	81,382,219			4,263,000		207,965,167
Towboats, Barges, Lighters						1,745,501
TOTALS	\$ 94,379,510	\$ 1,582,095	\$ 43,987,357	\$ 15,259,398	\$ 45,156,677	*\$805,997,969

* Includes Alaskan production in the amount of \$36,663,500.

WESTERN IDEAS spark new ENGINE INDUSTRY



EXHAUST SYSTEM for a Pratt & Whitney high-horsepower piston engine, ceramic coated by Ryan Aeronautical Co. This ceramic coating industry is a Western development that has wrought profound changes in the aircraft engine industry.

THE EAST is big. It has big business, big industry, big investments. While the West has the greatest concentration of airplane manufacturers, Eastern manufacturers build the big aircraft engines today.

The West is big, too, but in a different way. It is the "wide open spaces," the area of growing population, of increasing market, of great potential and big vision. We are not industrially hamstrung by big investments and plant installations. We are considerably more flexible.

Anything that is big—be it a locomotive, steamship, or the engine

manufacturing industry—is a difficult thing to start, turn, or stop. It cannot be readily flexible.

Here's Why

Right there is one primary difference between industry in the East and its counterpart in the West. We can alter our industrial course much more easily. We can recognize a potential and do something about it much more quickly. And because we are industrially young, we have the vision, the initiative, and the aggressiveness to go ahead and get the job done without all the big investment, the breaking

World War II stimulated heavy industry and aircraft production in the West to a point where they became fully entrenched as economic components in this area.

Could production of small engines be a similar Western good fortune in the immediate future? This article provides food for thought along that line.



By
ROBERT SWAN

Engineer
Aero-Coupling
Corporation
Hurbank

down of tradition, the financial hazards that inevitably beset big business.

So—while the big engine industry in the East is trying to change course

from piston engine production to jets, we Westerners are busy on entirely new problems equally significant to the industry.

There are more people to the square mile in the West who are dependent upon aircraft production than in any other part of the country. As a result, those people think in terms of aeronautical development. They are constantly trying to work out better ways of doing things (that's the mode, in the aircraft industry).

What We Did

For example, last year alone, Western technical skill, and engineering ability combined to create and introduce to the engine industry a number of significant developments. Among them are:

1. An extremely important method of making engine components.
2. At least three new production model engines.
3. A small sized turbo-jet engine that is applicable to personal aircraft.

Two Western firms, Ryan Aeronautical Co., and Solar Aircraft Co., both in San Diego, announced independently last year that each had developed a process for ceramic coating of aircraft piston-type engine exhaust systems and jet engine components. Ceramic coating of such parts offers the following advantages to the engine industry:

1. Permits use of lower alloys, thereby conserving critical materials.
2. Prevents oxidation of the exhaust system materials.
3. Prevents carbon absorption and corrosion attack in exhaust systems.

Early research in the use of ceramic coated exhaust systems was dictated by the need for finding adequate substitutes for critical alloy steels during World War II. Post war interest lagged until our international policing activities dictated renewed emphasis on material conservation.

Now, both firms are currently filling orders for ceramic coated parts for the nation's largest manufacturers of aircraft engines in the East as well as in the West.

These orders are not only for new piston and jet engine components, but for exhaust system parts to convert existing powerplant installations in both military and commercial service.

Did You Know?

Another interesting and valuable feature of ceramic coating on parts is the resistance to rough handling, exemplified in tests by dropping hot and

The Twain Have Met

A LOOK BACK through the pages of internal combustion engine history will reveal ample proof of the West's contribution to gasoline and diesel engine knowledge. Caterpillar Tractor, Enterprise Engine, and Hall-Scott, to name but three early day Western pioneers, are still actively contributing the fruits of their knowledge and experience to the nation's engine manufacturing industry in their Western plants. (They started their activity in the West, and later went East to serve a larger industrial market area.)

You may be assured that Western products will continue to be sought by Eastern markets. The old myth that "East is East and West is West, and never the twain shall meet" is now transcended by today's commercial situation where technical knowledge recognizes no geographic boundary.

With thousands of Western engineers employed on research projects involving all types of combustion power, we may feel secure in the belief that the West will continue to play a leading part in engine development and manufacture.

cold samples six feet to a concrete floor without harm. Hence, when these parts must be realigned after manufacture, rubber mallets, alignment jacks and alignment torches may be used without damage to the coating.

A New Industry?

Solar's engineers predict many ground applications for ceramic coated parts, among which are stove parts, engine parts for trucks, and industrial processing equipment where heat and corrosion are major factors.

Already bearing out those predictions in part, the 825-hp. Continental engine used in the General Patton tank

will have Ryan-built ceramic coated exhaust manifold sections.

A Western Habit

Two firsts in American engine manufacture are claimed by Solar Aircraft Co. of San Diego with the nearly simultaneous announcement of their Model T-45 portable hand-started, gas turbine-driven fire pump and their Model T-400 gas turbine-driven generator.

The T-45, announced a few months ago, was developed on assignment for the U. S. Navy. The first test model was delivered in June 1950. This prototype unit, tested extensively at the

WITH HOOD REMOVED, details are revealed of the installation of a Boeing 200-lb. 160-200 horsepower gas turbine engine in a 10-ton Kenworth truck.



Naval Engineering Experiment Station, Annapolis, Md., has received U. S. Navy approval. Production tooling contracts were awarded to Solar.

Solar has also received orders from the Air Force for airborne electric generator sets powered by the same gas turbine. Security restrictions prevent disclosure of the exact number of units ordered by the services.

In connection with the announcement, Edmund T. Price, President and General Manager of Solar said, "The search for a workable small gas turbine design has been under way for many years, and we are proud that Solar achieved it. We are confident that these engines will be the fore-runners of an extremely important new product line."

Simple, Practical

During a discussion of the most recent addition to the Navy's store of shipboard fire fighting equipment, Rear Admiral W. D. Leggett, USN, deputy chief of the Bureau of Ships remarked, "The Solar T-45 holds the distinction of being the simplest practical fuel burning engine yet constructed."

"It is also the smallest gas turbine developed to date and the only one started by hand. There are many uses aboard ship for a simple, compact, light-weight engine and in such applications the gas turbine often has definite advantages over steam, diesel and gasoline engines."

"It is especially suitable," Admiral Leggett added, "where the use is occasional and fuel economy is, therefore, not of prime importance. The shipboard fire pump powered by this engine can be used with no electrical or fuel connections to the ship, and can be carried easily by two men."

Small, Compact

The entire unit weighs 165 lb. without fuel tank, yet fits within a two-ft. cube framework. It delivers 500 gallons per minute at 100 psi. gauge pressure, with a suction lift of 18 ft. This is equivalent to the performance of a medium size fire truck.

T-45 is designed for operation on diesel oil, a considerably less hazardous fuel than gasoline. Use of diesel fuel will in turn reduce the Navy's logistics problem by eliminating the need for gasoline storage on ships. (Many ships presently carry gasoline solely for fire pump use.)

Among other advantages of T-45 over presently used units are: (1) greater reliability in starting, (2) absence of a cooling system, (3) simpler ignition, (4) less weight and smaller size for a given power output.

This unit develops approximately 45 hp. at a turbine rotor speed of 40,000 rpm. It would be capable, with appropriate gearing, of producing portable power for many other requirements of an emergency or transitory nature.

The T-45 gas turbine is simple in

design and has few moving parts, features which are generally true of this basic type of prime mover. The designers feel that as usage widens, unit cost will become comparable with other engines of similar horsepower and that maintenance and spare parts requirements will ultimately be less than for reciprocating engines.

With T-45 yet a bouncing babe in the world of power, Solar announced the manufacture of the first gas turbine generator unit ever to be installed in a U. S. Navy ship. Even as type was being set for this issue of *Western Industry*, design details of this light-weight, compact power plant were released from Navy restrictions. Designated the Solar Model T-400, the 250-kw. turbine generator unit will provide emergency shipboard power.

Mighty Midget

T-400 weighs 561 lb. with controls and reduction gear, and occupies a space less than three ft. square by five ft. long. But this mighty midget will replace a diesel prime mover roughly ten times heavier and occupying considerably more space. The basic gas turbine was completed and initially run in September 1949, then tested for several months at Annapolis Experiment Station before being delivered to Bath Iron Works in Maine for shipboard installation.

T-400 lacks a cooling system such as is required by conventional power plants; hence it is less vulnerable to battle damage, unaffected by sub-zero temperatures and much simpler to maintain. T-400 may be started and brought to full power output in 17 seconds. Compressed air, readily available aboard ship, is utilized for starting.

While the Navy design specifications call for a life of 5,000 hours, of which 500 must be at full load, Solar engineers admit that, as yet, little is known of the unit's ultimate life cycle.

Subsequent operation will doubtless bring about minor refinements, but there seems little doubt that this unit will point the way towards replacement of heavier forms of power for many applications where fuel economy is not the ruling factor.

By making relatively minor changes in design a similar prime mover could be built having better fuel economy and yet remaining lighter in weight and smaller in size than present reciprocating engines.

Jet, Jr.

An interesting project is in final development stages at Northrop Aeronautical Institute, Hawthorne, Calif. That is the "Centriflow" (copyright

THIS IS the "Centriflow" jet engine designed at Northrop Aeronautical Institute. It is applicable to personal planes (will be tested in a Ryan Navion) and guided missiles.



name), student built jet engine. The present model is an outgrowth of two previous engines built at the school, all designed and developed by NAI student engineers under the direction of faculty member and Chief Designer W. L. Tietjen. "Centriflow" culminates two years of intensive design and testing, and incorporates knowledge gained from its predecessors. The completed "Centriflow" jet engine was being run on a test stand as this article went to press.

Following test stand operations, it is planned to install the engine in a stock Ryan Navion for actual flight testing. It is quite possible that Ryan Aeronautical Company engineers will display considerable interest in the progress being made by Mr. Tietjen and his student assistants.

With simplicity and ease of production among the foremost design factors, "Centriflow" consists of a single stage centrifugal compressor, four through-flow combustion chambers and a single stage reaction turbine. This engine occupies a space 58½ in. long by 26 in. wide, weighs approximately 174 lb., and will develop approximately 340 lb. static thrust at sea level.

Try This On Your Plane

It is confidently expected that "Centriflow" will out-perform the Navion's stock 185-hp. engine while consuming about 27.5 gallons per hour of 91-octane aviation gasoline. In the words of one pilot, that sort of performance would be "Not bad, for a jet!"

Maintenance problems of this type engine appear simpler than in conventional types, since a mechanic, using only five standard wrenches, can effect complete disassembly in two hours. As with other reaction type engines, production models will sell for considerably less than their reciprocating equals, with corresponding reductions in spare parts cost.

With increasing demand for lightweight turbojet engines to power guided missiles and smaller piloted aircraft, we can expect to see more of this outstanding Western development.

Briefly announced in *Western Industry* last year, Boeing's entry into the gas turbine field has, during the closing months of 1951, created wide interest and comment among engine builders and users alike.

As part of a research program sponsored by the U. S. Navy Bureau of Ships, Boeing in 1950 installed a 175-hp. gas turbine in a heavy duty truck. At about the same time a similar power unit was installed in a 24-ft. Navy personnel boat.



SOLAR AIRCRAFT Company's T-45 portable gas turbine-driven pump is the first gas turbine ever to be started by hand. In an emergency, one man can start the compact power unit. Such engines have wide industrial possibilities.

As an immediate result of one year's testing of these two units, the Navy has announced that first production models will comprise part of the elec-

sence of reciprocating engine noise and vibration, reduction of gear shifting and good accelerator response.

More recent test results have led Boeing engineers to predict for the turbine faster response and greater flexibility than can be matched by any piston engine. Stalling of the vehicle or engine through improper shifting is impossible.

Power to Burn

From the truck operator's standpoint, performance of the 175-hp. Boeing Model 502 with a seven speed transmission was approximately equal to that of a 200-hp. diesel using a 12 speed gear combination, excepting for the fuel consumption. Boeing engineers now feel that by designing a truck for this type of engine and fully utilizing its 2,500- to 3,000-lb. saving in weight, as well as improving fuel economy, their turbine will offer serious competition to existing power plants.

The Navy has also announced a development contract with Kaman Helicopters, calling for experimental installation of a Boeing unit.

Describing Boeing's progress at a recent SAE meeting, Henry H. Hill, Turbine Project Engineer at Boeing, stated, "Our own belief is that competitive turbine engines are not far off, but of course availability for commercial use will depend to a large extent on the military situation."

Other Engine Developments

ALTHOUGH productive of nothing new thermo-dynamically, the small internal combustion engines of McCulloch Motors Corporation of Los Angeles are an outstanding example of commercial success. This is because of improved fabrication methods, notably applications of die-casting, which have put McCulloch in an extremely favorable competitive position nationally.

Research is being done at Stanford University for the Office of Naval Research by Professor A. L. London on free piston engines, consisting of an opposed piston two-stroke diesel driving a reciprocating air compressor. The big saving is in constructional simplicity, through the absence of crankcase and associated bearings.

tric generating machinery on mine-sweepers.

With 15,000 miles of operation logged on the test truck, most of it at 68,000 lb. gross vehicle weight, Boeing engineers have accumulated much knowledge of interest to users of portable power.

Notable advantages from the driver's standpoint are found in the ab-



New Western plant designs have a care for the community and employees as well as the stockholders, and it all pays off. Here, for example, is one of the new plants in Southern California that typifies . . .

the WESTERN PLANT TREND—

More square feet per dollar, and a beautiful daytime home

"HOW MANY square feet can I get, and how much will it cost per square foot" are the two most pertinent questions asked by executives in charge of building new industrial plants or owners who have been forced to expand into new quarters.

Cost of Floor Space

Rapid growth and expansion of industrial facilities in the West, coupled with the tremendous industrial demands brought on by two wars, have taxed available industrial space to the limit, with new plant construction at an all-time high. With cost factors in the building industry also at an all time high every effort must be made to obtain the maximum space possible within economic limits.

As ingenuity develops new methods and products to be manufactured, architects' ingenuity with contractors' and engineers' "know how" are required to put them into operation economically. New structural techniques and methods have made sizable contributions toward this end with the "Tilt-up" method of erecting concrete walls becoming one of the most popular at this time, even though Architect R. M. Schindler designed and built structures in 1925 in Los Angeles using these same principles. Pre-stressing concrete and concrete block panels have also made their contribution toward more economical construction.

Economy in Light Weight

The use of new lightweight aggregates in concrete and plaster are mak-

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Sumner Spaulding,
John Rex,
Architects



ing substantial contribution by reducing weight. Reduction in weight not only assists in "handling" processes but reduces the size of structural members and foundations which spell economy. Also, the new Youtz-Slick "left slab" operation, which consists of pouring the roof slab or intermediate floor

slabs on the ground and raising them into place with hydraulic jacks, has given a new lease on life to a number of new buildings now being constructed in Texas.

"Raising" the Roof

Another innovation is "Thermoccon." This material, developed for non-structural walls and roof slabs, is made of cement, water and other ingredients. A chemical reaction takes place when mixed with water and a slurry is formed.

When this material is placed in forms or used as a slab, the chemical reaction is not unlike the action of yeast on dough, and causes the slurry to expand to approximately three times its original size. The results give an economical, lightweight, strong material, with high thermo-insulating qualities as well as sound reduction properties without the application of additional surface treatments.

By its very nature the purpose and function of an industrial plant is clear. From a design standpoint there should be no philosophical debates which

ing their own architectural style. It is really now the exception rather than the rule when an architect will "add architecture" to a structure for the sake of architecture alone.

It was customary in the past in many industrial developments to segregate the administration and office space from the plant, placing these offices in a separate building, or a tacked-on appendage. In most cases this was done to add a touch of architectural style or "front" to the plant, while the remaining part of the plant lurks in the background minding its own business. Fortunately this type of thinking by industrialists who are building new plants and by architects has become obsolete, and many new striking examples of excellent industrial architecture are beginning to appear.

Consult an Expert

Industrial plant design has been in the past in most instances a catch-as-catch-can existence with the most mediocre, unimaginative results possible filling our cities and countrysides.

tween success and failure, would go to an expert in the field of design to get the best advice. It is not uncommon to go to a dentist to get our teeth repaired; to go to an attorney for legal advice, or go to a doctor when one is ill. However, in a great many cases the talent which is needed to create an efficient, economical and attractive industrial plant is by-passed, and mediocrity triumphs again.

Industrial Living

Few men have estimated the amount of time they spend during their lives in an office or in an industrial plant. Considering that in most cases a man spends eight hours a day, 48 to 50 weeks a year, over a period of 40 or 45 years, the bulk of his life has been spent in an office or plant, in most cases in dismal surroundings under trying, nerve-racking conditions. Few would disagree that his lot could be improved.

The design of an industrial plant requires certain basic considerations common to most well designed structures; the primary purpose being usually to produce or manufacture goods. This requires a master plan of the production procedure, from the raw material through its processing and final delivery. Here efficiency and function are the control factors.

Built-in Livability

Light and ventilation, either artificial or natural, materials and color used in construction establish a pattern of design and livability. Site planning, location of the property and landscaping contribute to the general appearance of the scheme.

A factor never to be underestimated and high on the list of planning requirements is the ever present possibility of expansion, and how to maintain efficiency at the present when and if future expansion takes place.

One of the most valuable and helpful tools an industrial plant can have, regardless of its size, is a complete, accurate master plan of the plant and site, with possible future developments. This simple expedient will very often restrain the usual hodge-podge, haphazard growth of an industrial plant and make for more economical and efficient operation in the final analysis. This is a money-saver over the long pull.

Painted-in Beauty

No single item in industrial planning has been so sadly neglected as the use of color. No single item can do so much for no additional cost. Drabness has been predominant in the industrial front in most cases in the past, with



GOOD PLANNING and thoughtfulness contribute toward a more integrated industrial architecture, at the Johnson Wax plant in Los Angeles.

would cloud and confuse the issue.

Fortunately there is no reason for a factory or industrial building to look like some other kind of building, although in the past many structures have been designed and built trying to imitate something which they can never achieve. This particular type of fraud was perpetrated over the entire country with profusion and contributes to the meaningless false facades which blight most of our industrial areas.

Today contemporary architects are giving the industrial building its rightful place on the horizon, and are creat-

In most cases the function of the plant, the life blood, the production procedure has been forced into an obsolete pattern because of lack of understanding of planning, or forced into an obsolete building and made to operate under the most trying and difficult conditions. This, coupled with the complete lack of flexibility in most old structures, makes for intolerable conditions in many industrial plants.

It would seem reasonable to conclude that anyone planning to invest a large sum of money in a plant, or where efficiency in a highly competitive world would spell the difference be-

very few exceptions, unfortunately.

Only in recent years has the use of good color been developed to a high degree, and used to good advantage in industrial installations. Dow Chemical Company has produced an exciting pattern of color in many of its plants by the simple expedient of using good, well chosen, strong colors on various mechanical elements in the plant.

The effect of color in the abstract pattern of pipe, tanks and equipment transforms a dull, uninteresting pile of steel into a sparkling, colorful exhibit. The effect of good color on the personnel of an industrial plant is almost electrifying; the attitude of workers is changed measurably.

Use Color Advantageously

It costs no more, if painting is to be done, to plan intelligently a color scheme which will be stimulating and interesting than it does to paint everything "ivory." Colors can be restful when required, and stimulating on other occasions.

A host of well designed, comfortable contemporary furniture, fabrics and colorful plastic chair coverings have made their bow in office space in the past few years to relieve the monotony of typical golden oak furnishings long since outworn and dog-eared.

Functional Furniture

Such a swing away from the precious antique and untouchable furniture at home to this rational approach in the office has been a shot in the arm to many business administrators. Unfettered by architectural styles, furniture and textile designers have moved ahead developing new ideas with a fresh approach, enabling the budget-conscious industrial manager to do a

more interesting and efficient job for less money.

Probably no single item in the building industry has been developed to such a high degree in the past 15 years as artificial lighting. The fine line dividing profit and loss in an industrial operation may be dependent on lighting. Efficiency is boosted, sickness and accident rates are reduced by this simple expediency—proper lighting.

See the Light First

Most new industrial plants in defense areas, particularly those connected with defense projects, are entirely illuminated by artificial means. In planning an industrial plant, do not be satisfied with anything but the best lighting, designed by a competent electrical engineer. Trying to patch up an inadequate lighting job is more costly than doing the job properly in the first place, and will cause inconvenience and delays which usually result in overtime to the electrical contractor in order to rectify the mistakes made by improper planning. Proper and efficient lighting equipment is available to everyone today — make use of it in your planning.

Good Examples

Recent issues of *Western Industry* illustrating the Sierra Electric Building in San Carlos, by Architect Francis Joseph McCarthy, AIA, give a refreshing approach to the industrial plant—a neat, clean, contemporary design, well oriented, devoid of architectural tricks and furbelows, it fulfills its functions adequately and efficiently.

The National Biscuit Company's new Portland plant (consulting architect Glen Stanton) and Lever Brothers plant in Los Angeles (consulting architect Welton Becket), also shown in

Western Industry, are striking examples of industrial planning. Their form, function, imaginative use of materials, color and orientation on the property all contribute to more appealing buildings of better design and function.

The untrained eye can readily detect the difference between a well planned, efficient plant and a "turkey," and employees would rather work in the attractive surroundings which the latter type of plant affords.

Western Trends

Architectural trends in industrial construction have progressed to new heights in the West. Many of these innovations have been regional considerations. Many more ideas can be used in the milder climates of the West than in snowbound Maine or windy Chicago.

Architects designing new plants in the West are no longer influenced by Eastern plants as they once were. Their structures are designed for the area in which they are located, and usually can provide more amenities than their Eastern prototype.

Where budget limitations in the hands of inexperienced designers often produce a cheerless haphazard result, in the hands of a good architect this can be overcome and capitalized upon in many cases.

Ponder These Points

The tendency to decentralize industrial installation has resulted in more available land in most cases, tending away from multi-story type buildings, except of course where manufacturing processes demand this type of project. This factor also usually has the happy solution of better housing for workers in suburban areas with reduced transportation problems.

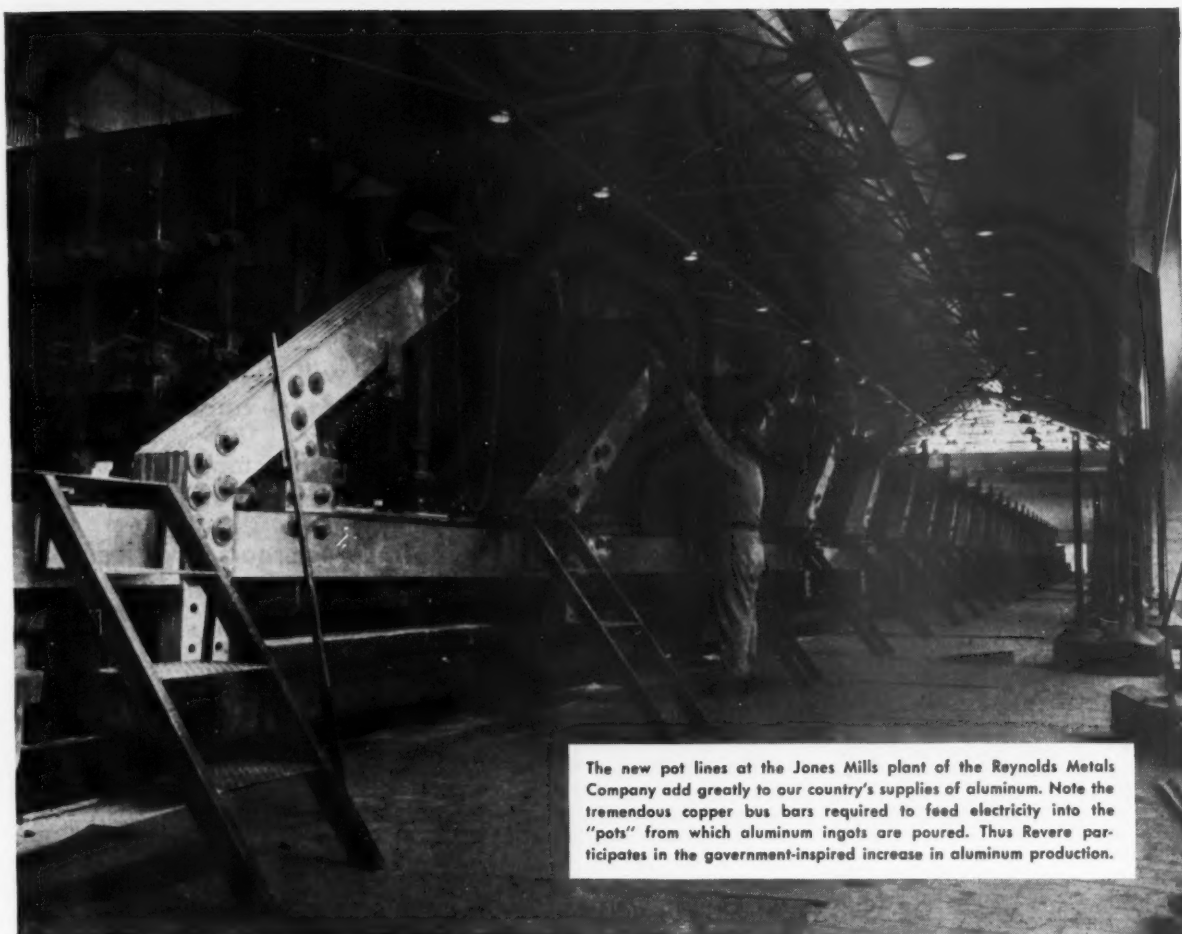
Simple, imaginative design, thoughtful logical plant planning, proper skillful orientation on the site and landscaping where possible, avoidance of architectural clichés and tricks, use of good color, selection of low maintenance materials throughout the project all add up to the cleanliness and harmony needed in the modern industrial plant.

These are the present industrial architectural trends in the West. These items readily enough are ordinary common sense; however it has been said that common sense is very uncommon, which no doubt has contributed greatly to the vast disorder and shabbiness of most of our major industrial centers.

Remember—buildings are only as dull and unimaginative as the people who design them.

A CLEAR, efficient, well-lighted working area on the second floor of Flintkote Folding Box factory in Los Angeles shows management's concern for employee attitudes and production figures: both improved. Recessed fluorescent lights are controlled for intensity at any desired working area. Note minimum of posts.





The new pot lines at the Jones Mills plant of the Reynolds Metals Company add greatly to our country's supplies of aluminum. Note the tremendous copper bus bars required to feed electricity into the "pots" from which aluminum ingots are poured. Thus Revere participates in the government-inspired increase in aluminum production.

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6 QUESTIONS

about Western industrial trends

1. Is the West now producing more of its own goods
2. Is Western industry becoming more diversified
3. What proportion of new industries are home-owned
4. How will defense activity affect long-range growth
5. What other major factors will affect future growth
6. Are Westerners effectively exploiting potentials

WHEN THE EDITOR said he wanted an article for the annual Review and Forecast Number that would take a look at some of the facts and figures of Western industrial growth to see just what they signify, we asked a number of business acquaintances in key spots for advice on the scope that such an article should cover.

"What basic questions about the West turn up in the inquiries that come to you—or, what do you think are the most important things that should be known about Western industrial development?"

We put this query to bankers, investment brokers, university and government economists, chamber of commerce managers, utility and transportation men, distributors, industrial executives, and consultants—some in the East as well as in the West. From their answers we sorted out six questions (see above).

These are interesting questions. To answer them adequately would require a full-length article on each; they can be treated only in broad outline here. Before going any further we'd better say that "industry" as here discussed means *manufacturing*, and the "West" means *eleven states*: Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Nevada, Arizona, Washington, Oregon, California. What may be said about it as a whole is not equally true of all its widely separated parts. Keeping this broad coverage in mind, let's look at the first question.

1. Is the West producing a larger

percentage of the goods it consumes than it did ten years ago?

The answer in over-all terms appears to be *no*. In 1940 there were about 34 industrial production workers per thousand people in the West, and 59 in the U. S. as a whole. In 1950 the figures were 47 for the West and 78 for the nation. The national increase was 32 per cent; for the West it was 38 per cent.

This six-point gain for the West is deceptive, however, for much of our industrial growth has not supplied our Western markets. The aircraft industry, which accounted for ten per cent of all our production employment in



By
**STUART
PARRY
WALSH**

Director
Industrial Survey
Associates
San Francisco

1950, makes no goods for local use. If we subtract its figures from the comparison made above, our number of production workers per thousand of population increased at less than the national rate.

We have expanded greatly in many other lines, including lumber, chemicals, apparel, cement and clay products, machinery, electrical equipment, and of course, primary and fabricated

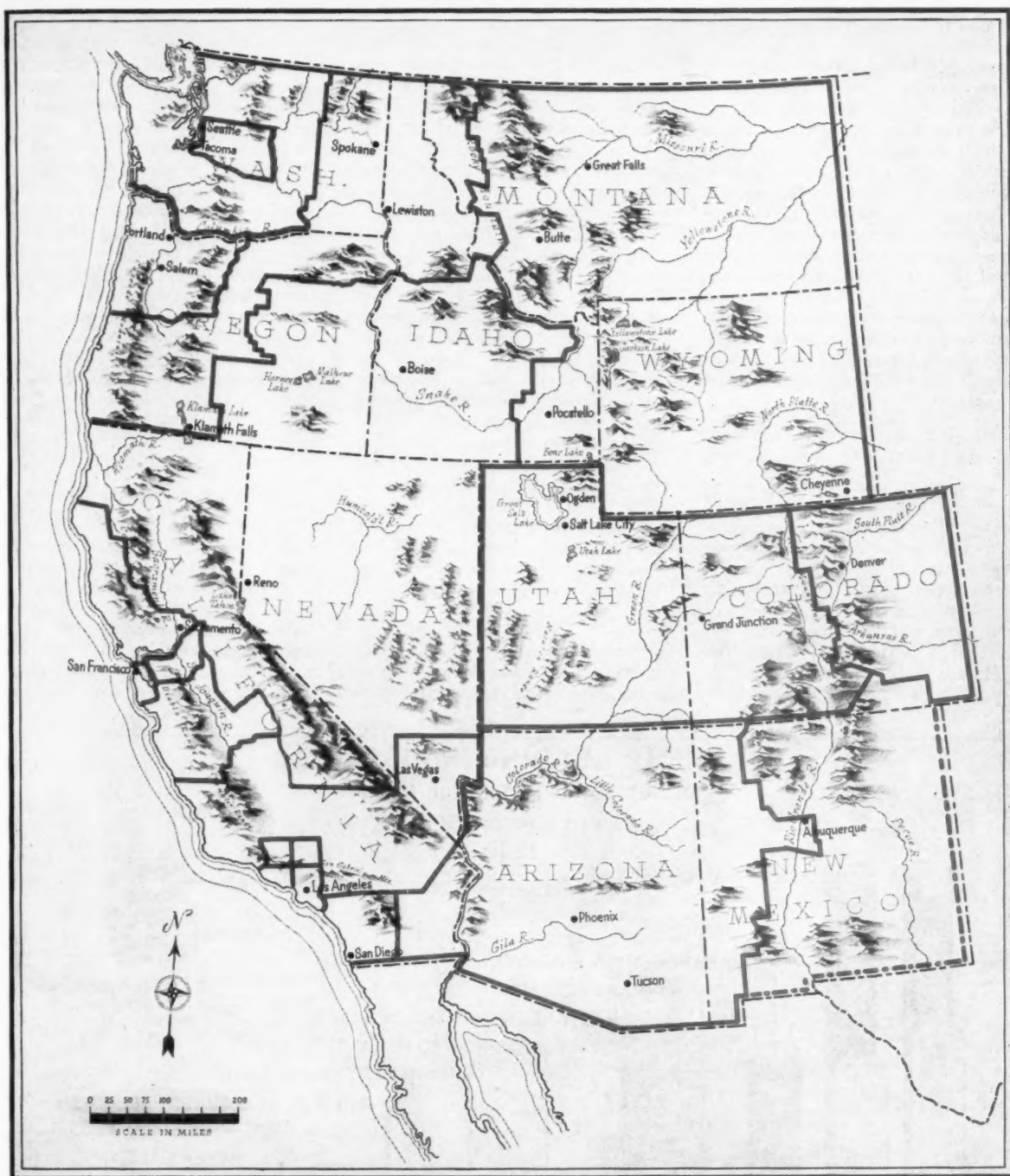
metals. Large quantities of these things, however, are going to eastern and overseas markets. We are also supplying one-third of the petroleum requirements of our armed forces, and one-third of the export deficiency of the closed Iranian refineries.

Behind the Statistics

Right after World War II, when the West was worried about finding jobs for its new millions, there was considerable emphasis on the opportunity for industrial expansion in lines where our consumption was far greater than our production. It was pointed out that no flat glass, cotton fabrics, high compression motors, or automobile bodies were made in the West, and only very small quantities of farm machinery, shoes, household tinware, refrigerators, men's clothing, radios, and many other products. The obvious aim of industrial growth, we were told, should be greater Western self-sufficiency.

Things haven't turned out exactly that way. With all our expansion and diversification, we still have no Western plants making flat glass, cotton fabric, car or airplane motors, or auto body stampings, and none of these appear to be in immediate prospect. Western production is still only a small fraction of Western consumption in farm machinery, shoes, tinware, radios, refrigerators and other "white goods." Some of the gaps may be actually getting wider, as Western consumption rises faster than regional production.

In many other lines of goods we have increased our output as fast as our Western market has grown, but



WHERE THE WEST LIVES: One million people for each division of the map*

Most of the population is concentrated in several metropolitan areas, especially Southern California. Away from the coastal region, which is the big consuming market, sparse settlement, difficult terrain and long distances between larger cities makes distribution problems difficult.

1950 CENSUS OF THE WEST

Arizona	749,587	Idaho	588,637	New Mexico	681,187	Washington	2,378,963
California	10,586,223	Montana	591,024	Oregon	1,521,341	Wyoming	290,529
Colorado	1,325,089	Nevada	160,083	Utah	688,862	TOTAL WEST	19,561,525

* Extreme southeast portion is only half a million people.

we are still a long way from self-sufficiency.

Is this a bad situation? Should the West produce more of the goods it consumes? Not unless we can produce them cheaper than we can import them. Our markets are still too small and too scattered to make Western production feasible in some lines, and in others there are industry patterns that deter branch operations. We are part of the national economy and there is no virtue in regional self-sufficiency, per se. When war requirements are eased, however, there will be many opportunities for Western plants to supply larger segments of the Western market—and this leads us to the next question.

2. Is Western industry becoming more diversified?

Diversification comes about in two ways—by increasing the number of major industry types that are substantially represented, and by multiplying the number of products in existing major types. Most of the recent diversification in the West has been of this latter sort, and there has been more of it on the Coast than in the Mountain states.

In 1939, seven of the 21 major U. S.

industry types were represented in the Mountain states by more than a thousand production workers each. Food products topped the list, followed by lumber and primary metals, and in much smaller size, stone and clay products, petroleum, machinery, and chemicals. By 1950 all these census categories had grown substantially and two added: furniture, with 1,200 production workers, and leather products.

In the Pacific Coast states, with six times the industrial employment of the Mountain states in 1939, there were 14 major industry types employing 6,000 or more production workers. These included all the types of the Mountain states, plus seven others: textile products, furniture, printing, paper products, fabricated metals, transportation equipment, and apparel.

Food, lumber, and transportation equipment (planes, cars, ships) headed the list, in that order. By 1950 all but one (textile products) had grown very markedly, and two major types had been added: electrical machinery and precision instruments.

A Boost from Technology

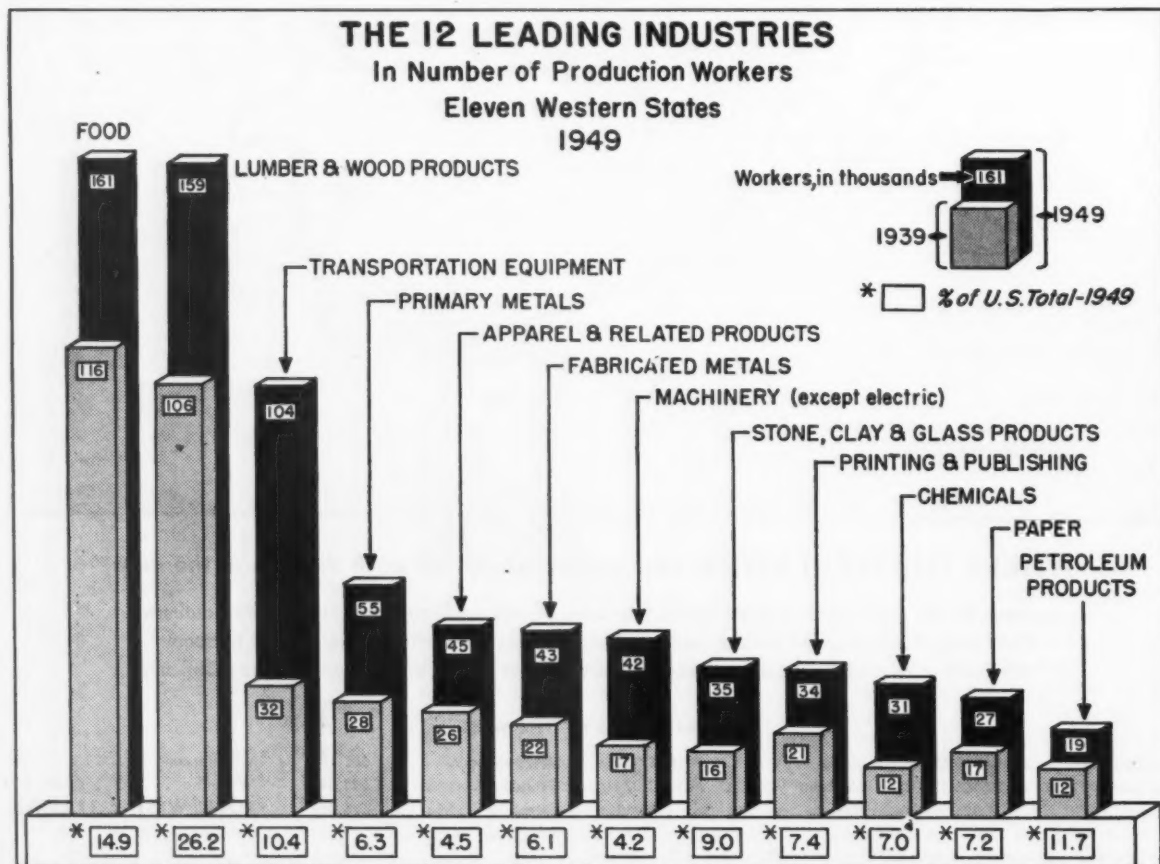
Diversification of products within these major types has been most rapid in the areas where concentrated mar-

kets and sources of supplies have made the growth of new products feasible. In the 1947 Census of Manufactures the Los Angeles area ranked first, second, or third nationally in value of output in 26 products, and fourth in 16 more. Among these high-ranking products, representing substantial portions of the national total, were the following: canned seafood, millwork, household furniture, pressed and blown glass, metal stamping, heating and plumbing equipment, pumps, plastic products, storage batteries, and lighting fixtures.

Much of the diversification now spreading through the West is due to new technology applied to the older basic industries. Petroleum chemicals started as by-products of oil, plywood and hardboard were by-products of lumbering, and poultry feed absorbed by-products of the fishing industry.

Offspring Surpassing Parent

It now appears that the value of such by-products may soon equal or exceed the basic products on which they are founded. Hillman Lueddemann, president of the West Coast Lumbermen's Association, said in a recent press interview that by-products from the nation's leading lumber states will soon employ more than the





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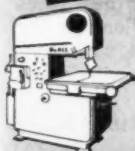
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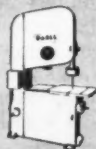
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number engaged in the actual cutting and producing of lumber. Something similar may result from the application of chemistry to the by-products of Western agriculture.

Other important stimulants to diversification are the subcontracting and purchasing activities of the aircraft industry, military and naval bases, automobile assembly plants, and major retail stores. Some of the "component" products, such as electronic equipment, have suddenly become sizable factors in the total industrial output, with prospects of further rapid growth.

3. Is the proportion of home-owned Western plants increasing as compared with branch plants?

While a great many small plants and a few large ones have been started in recent years by Westerners with local capital, there can be little doubt that more new jobs and output have come from branch operations. This is partly because branch plants are logically a big factor in Western industrial growth, and partly because Western capital has favored non-industrial fields.

Eastern manufacturers who have been serving the West through sales offices or warehouses are bound to consider branch plants when the regional market reaches a size that can justify them. Other Eastern companies, watching small plants in the West expand as suppliers to the automobile, aircraft or other industries, are impelled to enter this field to protect their future growth. Sometimes they can acquire part or full ownership of going Western plants that need new capital or management skill.

In World War II, when a major new defense plant was set up in the West with federal financing and priorities, it was usually a branch of a large national corporation, and this pattern is evident in the present defense program.

Western Capital Shies

Branch plants have been multiplying for other reasons—company policies involving labor, community relations, smaller unit operations, decentralized management, and so on. Along with market growth a number of Western communities offer interesting possibilities for putting these policies into effect. Consulting engineers and railroad industrial agents tell us that this Westward migration is due to continue; many eastern companies plan to set up Western branches as soon as defense restrictions are eased.

It has been frequently noted that it is hard to get Western capital inter-

ested in new manufacturing enterprises. A successful developer of industrial districts in Los Angeles, financing long-term plant purchases with second mortgages, has placed them in the East because, he says, "everybody out here seems to want a deal in residence or commercial property; industrial real estate doesn't interest them."

A group of men who have done well in large-scale Western farming were talking one day about their investment plans. Living in a locality where agriculture has reached its maximum and industry is fast expanding, they are buying land in new irrigation projects in Utah and eastern Washington. "Manufacturing is too uncertain," they said.

While Westerners who have made their money from ranches, mines, and city lots are looking for new opportunities in the same lines, men with industrial know-how are migrating from the East and starting local plants with money they bring with them. Often they have friends back East who say, "If you see an opportunity for a nice little manufacturing business out there, count me in." These new "home-owned" plants, which are really of Eastern origin, can be seen in many growing areas throughout the West. They are small, but many of them have good prospects of future expansion.

A Beneficent "Crown Colony"

Is it bad for the West to have a sizable part of its industrial activity under outside ownership? Does that make us a "crown colony of Eastern capital," as we are sometimes told? While an adequate answer can't be attempted here, there is room for three brief comments:

(1) While more independent home-owned plants are desirable, they don't necessarily have better prospects for survival and growth than branch plants do.

(2) The trend toward decentralized management and better community relations by larger corporations means less chance of shutdowns and more earnings spent in local plant areas than was formerly the case.

(3) Branch plants are not peculiar to the West alone; they are a spreading feature of our nation-wide industrial economy.

4. How is the defense program affecting the long-range growth of Western industry?

On this question the answer is different for different parts of the West. On the coast the aircraft industry is again creating work for many parts

makers as well as large-scale direct employment, and subcontracting has begun to spread into neighboring states. Although major new aircraft plants have been set up in the mid-continent region, the coast will probably retain its dominant position. An indication of this is the new Convair plant being built at Pomona, Calif., to employ 15,000.

Aircraft production must be regarded as a more sustained program than in World War II, but some of its suppliers will eventually get into civilian product lines. Conspicuously missing on the coast is the shipbuilding activity of World War II, which led to the creation of branch shipyards as far east as Denver.

The West has already received substantial allocations for other types of defense production. Most of the new plant facilities are in the Coast states, while large commitments for raw materials have been placed in the Mountain states. It is too early to tell how these will eventually be divided, or whether the West will get as high a proportion of defense business as it did in World War II.

Some types of defense production, such as light metals and explosives, make heavy drafts on power, water, and other basic resources with a relatively small addition to local employment. Some plants, however, are creating large-scale industrial markets.

Industrial dispersion as a security measure, which was widely discussed prior to World War II, is again being considered by federal agencies. This time it has new urgency due to the atomic bomb, but it is still resisted in some industrial centers, East and West, by management and labor. The dispersion program is not intended to bring about major dislocations, and will probably affect only a few highly critical industries.

A Favored Region for Permanency

A much more important influence on Western growth will be the permanent military establishments whose location is determined by climatic conditions and the availability of suitable land. The very large areas of land required by modern weapons for testing and training bases make this a favored region for the location of such facilities.

As in the case of aircraft production, the program is a sustained one—for "bases" rather than "camps." The civil and military personnel of these bases will be permanent additions to the Western consumer market, while construction and maintenance will expand the industrial market.

Continued on page 52

The Best Truck Investment You Can Make—



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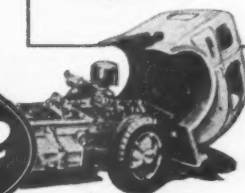


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5. What are the major plus and minus factors, aside from the defense program just discussed, affecting the future development of Western industry?

The answer to this question could be a book-length article by itself, but if we trim off all the details it can be condensed into a few paragraphs. On the plus side there seem to be four basic factors favoring further substantial industrial expansion.

First on this list is the *continuing population growth* of most of the Western states, a growth that is founded partly on climate and living conditions, partly on the attraction of better paying jobs, and partly on the basic urge to move Westward. In 1940 the 11 states had 10.5% of the nation's population; in 1950 our 19,701,000

people made 13.0% of the U. S. total. The Bureau of Agricultural Economics has estimated a population of 29 million in the West by 1975.

The West's Greatest Resource

More people now live in the three Coast states than in all of Canada. While it is true that population follows jobs, it is likewise true that population creates jobs. Producers are also consumers, and some are enterprisers and managers. The new people in the West are its main assurance of continued industrial growth.

Second on the list is *industrial raw materials*—timber, food and fiber crops, oil and gas, and minerals. In a few areas some of these resources have been partially depleted, but most of them are still largely undeveloped, and new ones are still being discovered. In

certain industries water and hydro-electric power are also considered raw materials, and these are potentially abundant in the north coast region. It seems clear that Western natural resources will supply an increasing volume of diversified industry for many years to come.

Third on the plus side is the *large-scale competitive steel-making industry* now established in the West, which will bring a host of secondary steel-using operations. While the full effect of this development is delayed by defense restrictions, the eventual results will be far-reaching. This phase of Western industrial advancement has been so widely discussed that it needs no further mention here. Close behind the steel industry in its long-range effect may be the light metals industry, located in the Pacific Northwest because of its dependence on low-cost power. While the potentials of aluminum and titanium are less clear to foresee than steel, they may bring to this region many secondary industries of major importance. Presently the power shortage in the Northwest is a handicap to industrial growth, but this is a temporary condition that will eventually be relieved.

Fourth among the chief factors stimulating Western industrial growth is the *large-scale construction program of Western business and of cities, counties, states, and federal agencies*. The defense projects peculiar to the West have already been discussed. Here we are referring to the tremendous total effect of building and maintaining the homes, roads, dams, water and sewer systems, schools, hospitals, prisons, parks, airports, harbors—all the endless list of new and enlarged facilities which the growing Western population requires. These are not make-work projects to cushion a possible recession. They are essential activities that will go forward as soon as defense restrictions are removed.

They will provide for many years to come a multi-billion dollar industrial market for a vast variety of products from carbon paper to building paper; from fractional horsepower motors to heavy-duty trucks.

Some Unavoidable Problems

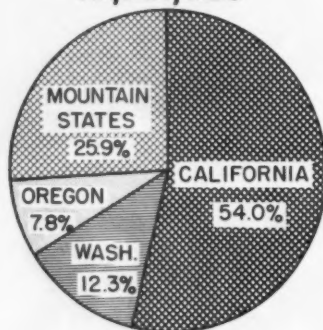
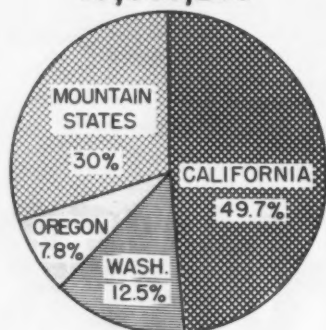
Against these basic plus factors there are some negative points to be considered. These, too, could make a longer list than here appears, but again we've tried to include only the most important and persistent elements—the things that will most seriously affect over-all industrial growth in the West over a span of years.

The first of these, of course, is *distance*—distance between the West and

Where Western People Live.....

POPULATION

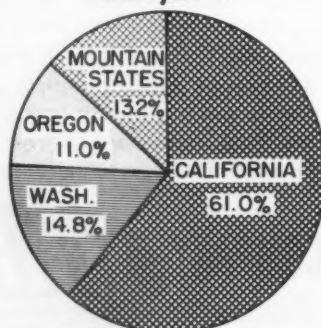
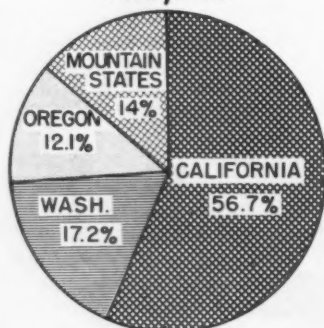
1940 compared with 1950
13,883,265 19,561,525



Where Western Goods are Produced.....

MANUFACTURING EMPLOYMENT

1939 compared with 1950
478,049 927,274



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peeled for every possible piece of iron and steel scrap.

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January, 1952—WESTERN INDUSTRY

53

the densely settled portion of the United States; distance between the settled areas in the West itself, including a lot of vertical as well as horizontal miles.

The map shows both phases of this distance problem clearly. It shows why Eastern manufacturers, impressed by Western growth, are sometimes baffled to discover that a plant site anywhere in the West would still be 500 miles from much of the Western market—which may cause them to wait for the West to “thicken up” a little more before they make a major new commitment.

Meanwhile the 1950 Census figures show that the distance problem is actually getting bigger. Some of the scattered population of the Plains states is moving West, and a lot of Westerners are moving too. Both groups are heading for the widely separated metropolitan areas of the West.

Can't Keep 'Em On the Farm

If we were to draw county boundaries on the map, and color the counties that lost population in the 1940-50 decade, the colored portion would cover more than half the total area in the West—this in spite of our 41% over-all growth. People aren't moving to a home on the range; they're moving into medium-sized towns and the suburbs of metropolitan centers.

The airplane has solved the problem of distance for communication and management, and in a few restricted fields, such as style apparel and cut flowers, it has overcome the distance handicap for goods. But except in a few high-value lines the problem of moving materials and products over long distances, not only *to* and *from* but *within* the West, will remain a serious one.

The high freight rates of which Westerners complain are part of the distance problem, and while many inequalities in these rates certainly deserve correction, the fact remains that goods can be moved more cheaply from Cincinnati to New Orleans than from Oakland to Spokane; the miles are fewer and the grades are easier by rail or highway from Denver to Chicago than from Denver to San Francisco. Nothing will change that; it is a cost handicap with which the Western manufacturer will always have to contend.

Distance also acts as a deterrent to regional unity and to Eastern understanding of Western problems. Salt Lake City and Boise are close neighbors, as Western geography goes, but Laramie and Fresno are not. It is hard for Albuquerque to make common cause with Portland, or for Reno to

find a fellow feeling for Kalispell. It is difficult for an Easterner to think of Seattle and Phoenix, or Billings and San Diego, as being in the same region and sharing problems of the West.

Water Problems

The second basic handicap of the West is the *unbalanced distribution of water and people*. The perversity of folks who insist on living in dry, sunny places instead of well-watered areas has created one of the West's most difficult problems, and one that will be costly to solve.

It is a problem that has crept up from two directions—first from the unforeseen increase in the total and per capita use of water, and second from the diminishing supplies of water that were thought to be ample for expanding needs. Agricultural water uses in California expanded by one and a half million acre feet in 1950, according to the Bureau of Reclamation, and there were heavy increases in other states.

It seems clear that people will continue to move into water-deficient areas, and then will expect water to be brought to them from wherever it can be found. It seems clear also that the cost of doing this will prevent certain types of industry from locating as close to their markets or raw materials as they would like to do, and it may cause some industries, and some types of agriculture, to move out of locations where they are now established.

There is plenty of water in the West that can be conveyed to where it is needed—at a price—but there is violent dispute as to just where the pipes and ditches should run, and who

THE QUESTIONS discussed in this article are to be made the subject of further study in an early report, one of a series on area development by the Bureau of Research of the University of Santa Clara.

should run them. Water claims are guarded as closely as the gold claims of the '49ers, and there's a lot of argument over who drove the stakes. Speakers at every state and regional gathering in the West deplore this situation, and point out how much cost would have been saved if their particular proposals had been carried out ten years ago. Delayed solution of water problems has hampered Western growth, and will probably continue to do so.

A third obstacle to future industrial development in the West is the growing competition of other regions, where strenuous efforts are being made to

stem the tide of Westward migration. Most active in this cause is the Gulf South. The aggressive competition of its ports has diverted traffic from the West Coast, and its cheap fuel, growing markets, and lower labor costs are strong attractions for large-scale industry.

“Most of our clients contemplating branches in the West have Texas in mind as an alternative,” said a management consultant whose firm serves many Eastern manufacturers. Texas gained 18,000 production workers from 1947 to 1950, according to the Bureau of the Census; nearly half the gain of California.

Along with the Gulf South, the Southeast is moving up rapidly. The South Atlantic states gained 41,000 production workers from 1947 to 1950, two-thirds as many as the West. In both regions industrial expansion is continuing on a large scale, sparked by vigorous economic and political promotion. Birmingham, Alabama, has just over-subscribed a half-million dollar fund for a campaign to bring new industries, warehouses, and sales offices to the area.

But while these fast-growing regions are competing for industry that is on the march, other regions are making determined efforts to stop it from marching. The New England, Middle Atlantic, and Great Lakes regions lost four times as many production workers as the West gained, from 1947 to 1950, and business leaders in these areas are seeking to reverse this trend by improving the “industrial climate” and building more efficient plants.

Meanwhile Eastern industrialists are being told that if they want to serve the new markets and still be close to the old ones, Iowa and Missouri are the best places to do it. St. Louis announced over \$200 million in new plant commitments in the first half of 1951, and in the Kansas City area the Federal Reserve Bank is just completing a two-year study of new industrial potentials.

Competitive Years Ahead

All these efforts, beneficial to the country as a whole, can not stop the growth of the West. They can probably slow it down, however, and Western states will face tougher competition in gaining new industrial payrolls. That brings us to the last question on our list: “*Are Western communities and the Western states effectively exploiting their industrial potentials?*”

There isn't space to discuss this question here, but it will be dealt with in another article in *Western Industry* in an early issue.



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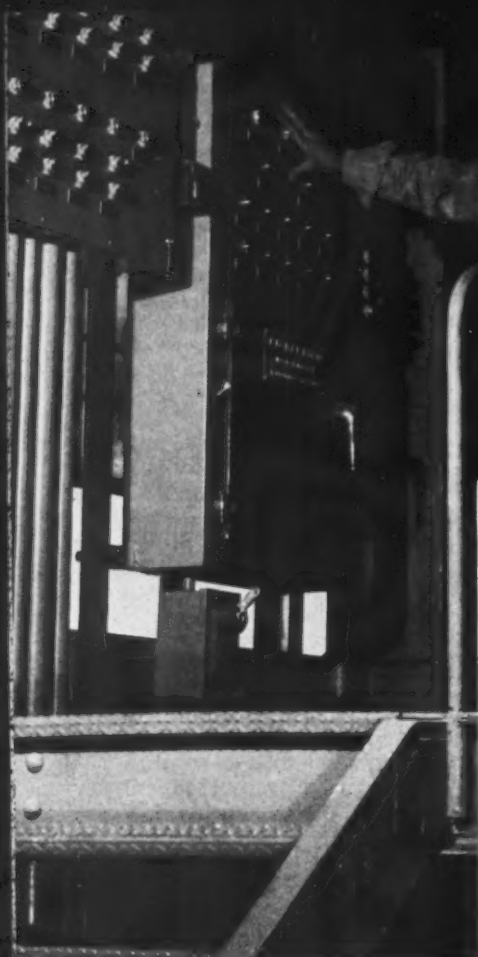
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(Note: Regional U. S. Census of Manufactures statistics for 1947 reported here have only recently become available, and therefore are the latest figures available on many industries.)

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AIRCRAFT PRODUCTION—

Manpower and machine tool shortages imminent. Testing activities moved to open spaces, fabricating becomes urban

OUTSTANDING TRENDS that will be important in 1952 include:

1. Movement out of congested areas insofar as actual flying and testing is concerned. Lockheed, for instance, ran out of airport space and expanded into the Antelope Valley with a big operation which can draw manpower from the not-too-far-distant San Fernando Valley and other more distant areas.

Tendency will be to take the fabricating work to where the people are, the testing work to the open spaces away from built-up areas. This is necessary also because of the greater speeds and consequent length of landing fields, plus weight of the heavy models.

2. Expansion of the use of magnesium, which has its own special functions. Production ballooned last year, with more plants opened. Demand will continue to rise.

3. Complexity of the modern airplane, plus need for greater precision in manufacture because of the high flying speeds, will make the need for skilled manpower acute in 1952. Training programs will have to be highballed because needed experts just don't exist—they'll have to be made. Closer tolerances mean still more precision machine work.

4. The inter-sectional rivalry re decentralization of aircraft production cooled off. Texas put a hard fight but couldn't win because there simply aren't the people there in the big open spaces. Industry people weren't worried because they knew this would have to come. The President's policy on decentralization made this clear, too.

Result has been that the general pattern of World War II in aircraft has continued, with most of the reserve plants either back in operation or with plans well laid as to when they will be called into play. There is still open capacity, since only a few plants are working around the clock. Insofar as building new plants is concerned, the national policy precluded this until

capacity was reached, but new secret weapons may be quite another story. There is much not now known that will be revealed in 1952.

It is significant that of the six manpower shortage areas listed by the Office of Defense Mobilization in its October quarterly report, four owe the shortage mainly to aircraft needs. These are San Diego, Wichita, Indianapolis, and Hartford. The West shows no surplus areas—all 22 are in the East and South.

Long lead time is increasingly serious in the present program on account of greater complexity of new aircraft models. The airframe used to be the item with longest lead time. Now so much equipment is complex, and precision such, with so many manufacturers and subs involved, that many components are far more critical than the airframe.

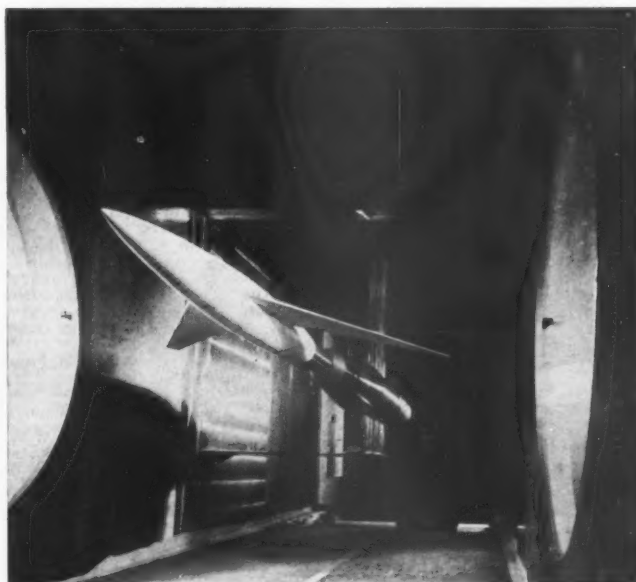
Jet engines are one of the tightest bottlenecks as a result of the fact that machine tools needed are so scarce. Many components of such things as electronic equipment, etc., require so much lead time that work is started on them even before the plane itself has been completely designed or performance tested.

In the past, West Coast aircraft plants have produced approximately 56% of all the nation's aircraft.

Of each aircraft sales dollar on the West Coast, it is estimated that slightly over 46 cents will go to subcontractors and suppliers. About 28 cents of this figure goes to companies classed as small business.

Today, the United States has eight types of jet fighters and five jet bombers in production. Jet pods have been added to the USAF intercontinental bomber, increasing its performance;

SINCE LATE IN World War II, 53 different types of jet planes, including four with rocket engines, have been developed in the United States. Additional advanced types now are in design and development stage. Photo shows test of advanced type in wind tunnel at Moffett Field, Calif.



one eight-jet bomber, a flying wing configuration, has been tested; and two new eight-jet long-range bombers were scheduled to fly as this issue went on the press.

The shortage of new machine tools is one of the most serious problems of all defense industry, and has been felt by aircraft manufacturers. Although extensive stockpiles of standard tools were built up following the last war, these tools fail to meet today's requirements, primarily because new types for special purposes are necessary.

Most of the stored tools that can be used have required extensive reconditioning in order to meet the tolerances

demanding today. Presently the machine tool industry is loaded far beyond its capacity, and delivery time for new equipment in this category is about two years.

Today's high performance, heavy and exceedingly complicated aircraft—with their heavier gauges, more critical tolerances and highly specialized structural forms—require manufacturing operations involving large complicated special machinery which cannot be obtained on short notice.

No significant changes occurred during 1951 in sources of the West Coast aircraft industry's raw materials. However, as a result of the rap-

idly accelerating aircraft production program, greater quantities of materials have been required by the industry. Superimposition of the defense program upon a high level civilian economy has resulted in a number of materials shortages—the greatest of these from the aircraft production point of view being in certain shapes and forms of aluminum, some types of steel, and alloying metals.

At present, there is no significant trend toward use of new materials in aircraft production; there is, however, some indication that titanium and boron steels may be used in future aircraft and that there may be an increase in the use of magnesium.

Aircraft engines have been in short supply during the past year.

In the components and accessory field, difficulties have been encountered in procurement of electronic equipment. The highly complex electronic devices required in the latest military planes must be manufactured to ultra-precise specifications. As a result of these high requirements, plus shortages of machine tools and materials, deliveries of electronic equipment have been delayed in general throughout the year.

Employment in the West Coast aviation industry was approximately 160,000 persons as of December 15, 1951.

TOOLS AND DIES—

*Industry output seems limited only by supply of skilled men.
Tool quality being improved*

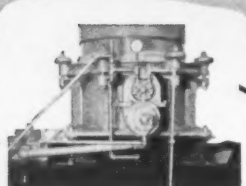
TOOL AND DIE industry in these parts is really humming, keeping pace as far as possible with the defense effort and increased consumer demands. Sales for 1951, for example, are estimated at double those of 1950. Next year will undoubtedly show a still further increase, limited probably by the shortage of skilled men.

Continuing influx of population and industry will ultimately result in more products being manufactured in the West. This will also mean tooling of better quality for longer production runs.

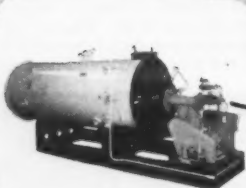
At the present writing, and in the immediately foreseeable future, all of the shops are employing skilled men, regardless of age. Longer hours and extra shifts are necessary. Many shops are working with a State approved apprenticeship plan.

Many shops have installed new precision tools, and would buy more of them if they were available on reasonably prompt delivery.

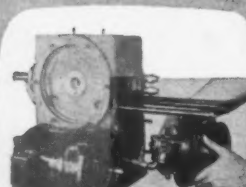
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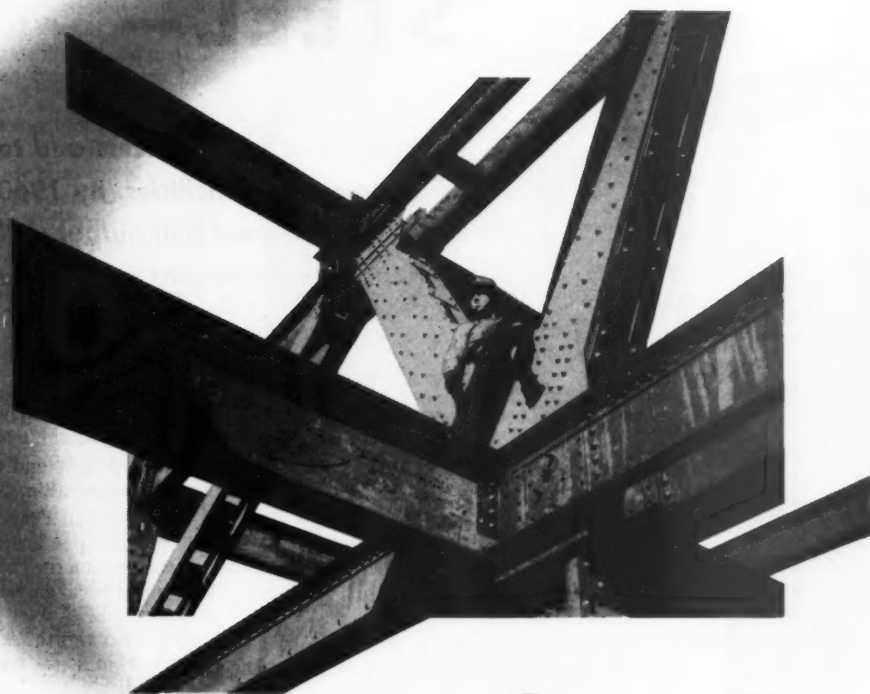
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STEEL—

All Western producers add to production facilities. By 1960 Western steel mill output will double its present record size

Peak (Maricopa County) Arizona, a number of small deposits in southern California, and several deposits of unknown size in Nevada.

In a sketchy fashion, here are some of last year's highlights in Western steel activity:

Seidelhuber Iron & Bronze Works, Seattle, late in the year installed an electric furnace. A small strip mill is planned.

Western Tube Co. announced plans to build a Los Angeles plant.

Many steel warehouses and distributors expanded facilities and broke ground for new plants. Market areas were enlarged, and services improved.

Structural Steel & Forge Co., and American Foundry & Machine Co., Salt Lake City, affiliated, also expanded operations. Equipment for making alloy steel was installed at American Foundry & Machine Works.

Pacific States Steel, at Niles, Calif., are not standing still, but they have not yet announced officially what the future holds for them, in the line of new facilities and expansion program.

STEEL, backbone of the nation, is a healthy, growing industry in the West that is probably going to attain twice its present size in the next ten years.

According to authoritative estimates, this is what will probably happen to steel in the Far West (West of the Continental Divide) between now and 1960: ingot production will be doubled; finished steel mill output will increase from over 3,000,000 tons to over 6,000,000 tons; production of iron and steel castings will likewise be doubled.

Big Things in the Wind

From what we hear, there are some large developments in the wind, as yet unannounced officially.

Iron ore deposits in the West are available to support a steel productive capacity far greater than that of the present, for more than a generation to come, and probably for 50 years.

Those deposits are located near Cedar City, Utah (a source for Geneva, for Fontana, and Colorado Fuel & Iron Corporation), and at Eagle Mountain, California (source for Fontana). Other deposits, known to have recoverable reserves in excess of 1,000,000 tons each, include Pikes

per cent. A bolt and nut department went into operation.

At South San Francisco Bethlehem enlarged its open hearth capacity and its transmission tower fabricating shop and installed a galvanizing unit. All Seattle facilities were completed, also a structural and tower fabricating department, and nut and bolt facilities improved.

Columbia had virtually completed 85 per cent of a second major construction program at Pittsburg, Calif., involving expanded sheet and tin mill operations, such as a new four-stand cold reduction mill to supplement the present five-stand mill and a continuous sheet galvanizer, the first in the West. The new facilities will bring the sheet and tin mill's capacity up to 646,780 tons of sheet and tin plate.

At Columbia's sister subsidiary in Utah, the Geneva mill added a tenth open hearth furnace and two furnace soaking pit batteries to produce an additional 160,000 tons of ingots. In the first quarter of this year facilities will be completed for producing hot rolled sheets from coils, maximum sheet size 60 x 240 in.

Kaiser's mill at Fontana, Calif., installed its eighth open hearth furnace, two additional soaking pits and related facilities, bringing the mill's rated ingot capacity up to 1,380,000 tons. A tin plate mill with a rated capacity of 200,000 tons a year is scheduled for completion in the second quarter of 1952. Negotiations are in progress for a \$65,000,000 expansion program to increase the mill's supply of pig iron, including a third blast furnace with a rated capacity of 1,200 tons of pig iron a day, 90 new coke ovens and considerable development in Kaiser's iron ore mines in Riverside

Big Business Is Busy

Now to the big four of the West: U. S. Steel (Columbia and Geneva), Kaiser, Bethlehem Pacific, and Colorado Fuel & Iron Corporation. This is what they have been doing:

Bethlehem changed over from open hearth to electric furnace operation at Los Angeles, using two 75-ton and one 50-ton furnace, giving an annual capacity of 370,000 net tons of ingots. The 12-inch rolling mill was rebuilt and a new continuous billet heating furnace for it constructed. Wire mill annealing capacity was quadrupled and wire drawing output increased 20

County in southern California.

Colorado Fuel & Iron Corporation has projected expenditures of about \$41,000,000 over the next three years, mainly in a new seamless tube mill and related facilities at Pueblo, plus a new coal washery at Pueblo and completion of the new Allen Coal Mine in Las Animas County.

Other improvements under way include rebuilding a blast furnace, constructing a new ore crushing plant and numerous other projects. On the rate of use prevailing at Pueblo in 1950, and taking into account added future requirements, it is estimated that CF&I has proven reserves of iron ore for a period of 20 years or more.

Tanks in the West

Last year was undoubtedly one of the record production years—if not the peak, of heavy metal tanks throughout the entire country. Next year, best estimates have it that production will be down somewhat—possibly even approaching a cut of as much as one-fifth of last year's figure.

It is anticipated that the steel sheet market will ease up to almost an alarming degree. Whether this relaxing will be absorbed in a reallocation of the percentages for customer durables such as refrigerators, automobiles, etc., is not known at this time.

Competition in the tank manufacturing business is growing warm. Resulting from this situation is the decision by many producers that the best way to meet competition and still show a profit is by using automatic welding processes. A by-product of this action, of course, is that less experienced persons can now be employed in that activity.

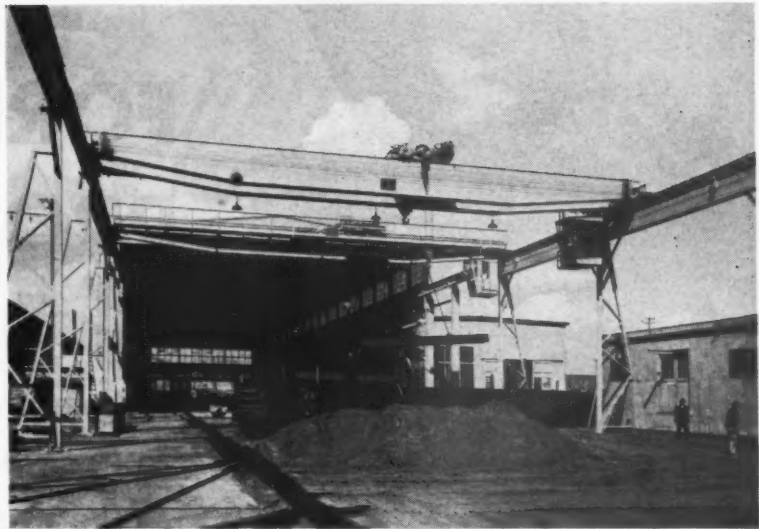
Some tank manufacturers had started to expand their market areas, but whether this sort of activity can continue in the months to come is not yet crystal-clear. New allocation percentages may change that picture.

By way of new production facilities, Geneva is going to start a new sheet mill operation in the immediate future. This will change an entire supply area as well as potential marketing area for sheet steel tanks.

BEDDING—

Will rubber replace feathers?

BEDDING MANUFACTURERS in the West, like hosts of other industries, are worried about their steel allotments. Perhaps the principal change in the industry in the last year is an increasing of Latex, which promises to accelerate to the point where an important percentage of bedding production will be in this material.



ANOTHER EDERER CRANE AT WORK

IN A

**STEEL
FABRICATING PLANT**

The materials handling requirements of this steel fabricating plant called for cranes to meet special job requirements. EDERER "job-engineered" these two to meet these requirements. Similarly "job-engineered" EDERER cranes are moving materials in many Western industries.

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All-Electric Overhead Cranes • Grapple Cranes • Monorail Hoists • Hand-operated Cranes



CHIP HANDLING at Forest Fiber Products Co., Forest Grove, Ore., makers of hardboard.

FOREST PRODUCTS—

Fir and redwood set all-time production records. Pulp industry moves into the waste wood market.

LAST YEAR was the all-time record breaker both in production and shipments in the Douglas fir region. Estimated output of 11.4 billion board feet tops 1950's 10.5 billion feet, which was a record up to that time.

Shipments last year total 11.28 billion board feet, which is also a new record. Orders will total 10.68 billion board feet, off from the extreme high order file of 1950, but still second highest on record.

Total value of the Douglas fir lumber output in 1951 from western Oregon and Washington will be \$923,000,000, another record-smasher.

Fir Expansion

One of the highlights of the Douglas fir industry is the expansion of fir manufacturing into the three northwestern-most California counties. There are now about 400 mills estimated to be producing Douglas fir lumber in Del Norte, Humboldt and Mendocino counties.

Five years ago there was only a trickle of fir lumber from a region where redwood was the dominant species. All that has now changed as Eureka takes on the proportions of a boom town with lumber expanding all over the place.

1952 Will Be Good

Probably 1952 will be another good year for the Douglas fir region. Demand for lumber is estimated to be about the same as last year. This reasoning is based on continued high demand for home construction with 1,000,000 homes to be built in 1952; stepped up lumber demand from farmers who have money and desire to im-

prove their farm plants; larger purchasing of lumber by defense and military; high demand for industrial lumber; high export shipments.

Pine Progress

Year before last (1950, that is) still holds the Western pine industry's production record of 7,687,000,000 board feet. Last year's figure is not yet available.

This year is impossible to forecast. Production may reach, but will probably fall below, that of 1951.

Associated woods (Douglas Fir, White Fir, Larch, Englemann Spruce, Incense Cedar, Inland Red Cedar and Lodgepole Pine) are becoming increasingly important.

Redwood Production

Redwood production has been increasing steadily, with the advent of new mills in the region. Present estimates show production of 744,000,000 feet in 1949 (when lumber production was down in all lumber areas), 875,000,000 feet in 1950, and an approximation of 900,000,000 feet for last year, which will undoubtedly set a record for redwood production.

It seems certain that residential requirements for this year will be less than for last year, and redwood consumption will be consequently affected, since no new market areas are evident to take up the slack.

In the southeastern part of the U. S., Tidewater Red Cypress production has decreased because of lack of available timber. Properties of redwood lumber are such that it is being picked by former cypress users to fill their needs.

Probably the biggest development in the Northwest last year was the sudden expansion in the wood utilization picture. Pulp mills are now taking tremendous quantities of leftover wood from sawmills and plywood mills in the form of wood chips. These chips are made right at the mill from slabs, trim, edgings and leftover wood after lumber and plywood have been manufactured.

Chipping Plants

Crown-Zellerbach built, or had built, eleven such chipping plants in conjunction with sawmills and plywood mills in Oregon in 1951, which are supplying approximately 20% of the wood needs of their giant 1,000-ton-a-day pulp mill at Camas, Washington.

One pulp mill in northern Washington is getting most of its wood needs from this source. Another large pulp mill at Longview has established a chipping plant and concentration yard at Springfield, Oregon, 180 miles south of its large pulp mill and is buying slabs and edgings and trim from more than 20 small mills and chipping them and then shipping the chips to Longview.

This move into the waste wood market by the pulp industry has been sudden and dramatic. It will continue at an even faster pace this year.

Plywood Is Active

In addition to the increase in Western lumber production since late in the war period, the plywood industry has also moved in. Most of the plywood plants are producing Douglas fir plywood. One of them, the M &

M Woodworking Co., in Eureka, Calif., is manufacturing redwood plywood. Others have announced that they expect to produce redwood as well as Douglas fir.

For quite a while, plywood industry was riding high. Now, however, though it is still riding along, it is on a somewhat lower level. Some mills are turning out very little production, comparatively; others are just a bit slow, but the industry is still in good shape, generally.

Plywood vs. Hardboard

Actual increase in the industry has been terrific. Peelers (logs for plywood) have been very high. Competition for timber has been great. But now the industry has assumed a more nearly normal activity level.

Plywood will probably lose some markets to hardboard. Quite a little new hardboard production is becoming evident in the West. Hardest hit no doubt will be the mills that do not have hot presses, and cannot make the exterior grades of plywood.

Glued Products

Some of the Western firms have been experimenting with and have started production on edge-glued and end-glued lumber, using electronic equipment. Research continues on seasoning and manufacturing processes, providing continuous improvement to the regular lumber products.

One other highlight of 1951 was the rather strong increase in use of Douglas fir lumber in southern states. This has been a steady growth, with southern buyers demanding larger and larger amounts of our species each year.

More Tree Farms

Continued expansion of the tree farm movement is worth mentioning. We now have over 4,000,000 acres of private, taxpaying timber land in the Douglas fir region of western Oregon and Washington certified as West Coast Tree Farms. This has been an increase of close to 332,672 acres in 1951. It represents about 37% of the total industrial forest ownership.

Development of by-products industries is stepping ahead with addition of new hardboard and softboard mills to turn sawmill leftovers into consumer goods. New bark products, reactivation of the Springfield alcohol plant, new chemical plants using stumps from the pine region, possible charcoal plants, all are in the wind. The Northwest still is on a wood economy with its total cash income from the forest products industries in 1951 topping \$1.8 billion.

Cummins Diesels

ARE PRECISION TENSIONED WITH

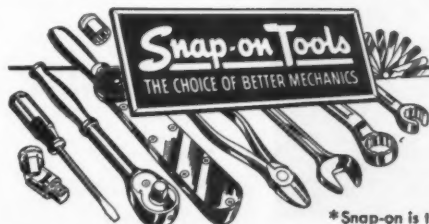


Each Cummins Diesel is built not once, but twice.

One of the big reasons for the high reputation of Cummins Diesels is the *extra* care Cummins uses in building its engines. For example, each Cummins Diesel is run in after assembly, then completely disassembled for reinspection. Then it is carefully reassembled and tested again. In both assembling operations, Snap-on Torqometers are used to assure complete accuracy of tensioning.

When precision machinery is assembled with bolts, mechanical distortion and excess wear of moving parts often occur if bolts are tightened to unequal or improper tension. To insure correct bolt tensioning, use Snap-on Torqometers... accurate as a watch, yet so easily read that even inexperienced workers can use them.

Snap-on Torqometers are built in 15 standard models, capacity from 0 to 30 inch-pounds up to 2,000 foot-pounds. At-your-elbow service from factory branches in 42 important industrial centers. Write for the Snap-on Industrial Catalog and the 104-page General Catalog of more than 4,000 Snap-on hand and bench tools for production and maintenance.



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PULP AND PAPER—

This industry is riding high and faring well, at the moment. One result is cleaner forests.

PULP AND PAPER industry, at this writing, seems to be riding on the crest of a high economic tide. Two basic reasons contribute to this good fortune: (1) pulp production from Europe never did return significantly to the U. S. market after World War II, and (2) the overall use of paper in this country keeps on going up. It is now around 400 lbs. per capita.

Coast mills, including those in British Columbia, have all been steaming along seven days a week on pulp. Most paper mills, both in this country and in B. C., operate only six days a week.

Paperboard (such as is used for containers) is down a little, but that is seasonal.

New production put to use last year was a big high grade pulp mill at Prince Rupert, B. C. (Columbia Cellulose). Facilities under construction include: doubling of MacMillan pulp mill at Nanaimo, B. C., a new kraft pulp mill added to Weyerhaeuser Timber Co. lumber and pulp activity at Everett, Washington, addition of a kraft board mill for Weyerhaeuser at their already huge wood-using industries at Longview, Washington.

This coming year will probably see the beginning of construction of the first pulp mill in Alaska, near Ketchikan. That mill will have an initial capacity of 300 tons, with later plans for 500 tons.



RAYONIER, INC., Aberdeen, Wash., has a pilot plant operation to convert sulphite waste into Raylig, an effective dust-settling agent. Here is shown a heater, where starts the Raylig making process.

This pulp and paper boom is having an overall effect that is significant. It is resulting in better cleaning up of woods, a high degree of wood utilization at lumber and plywood mills, and

Pulp, Paper, and Board Shipments

Source: 1947 Census of Manufactures—
In Millions of Dollars

	Pacific \$	Wash. \$	Calif. \$
Bleached sulphite wood pulp	88.6	....	....
Unbleached sulphite wood pulp	36.5	24.5	....
Bleached sulphate wood pulp	10.3	....	....
Unbleached sulphate wood pulp	29.1	....	....
Ground wood pulp	17.4	....	....
Miscellaneous wood pulp	3.7	1.4	....
Book and fine paper .....	....	18.7	....
Coarse paper	46.0	31.4	....
Sanitary and tissue paper .....	....	....	....
Oregon	\$3.9	....	....
Container board	27.7	14.9	....
Bending board	16.7	....	....
Non-bending board	2.2	....	....
Miscellaneous paperboard	5.2	....	4.0
Building paper (including miscellaneous building materials)	10.6	....	10.6

vast advances in good forestry practice.

Toward the end of abating water pollution resulting from their operations, Crown Zellerbach's pulp and paper mill at Lebanon, Oregon, in conjunction with Soundview Pulp Co., Everett, Wash., has satisfactorily concluded a two-year pilot plant experiment at Lebanon.

As a result, plant scale installations have been authorized for evaporating

and burning spent sulphite liquors at the Lebanon mill. Crown Zellerbach is installing, on a mill scale, facilities necessary to remove wash waters from the spent sulphite cooking liquors and burn the residue in mill boilers.

Experiments so far and the new facilities will cost about \$500,000.

KRAFT PAPER—

FOR THE FIRST 10 months of last year, about 267,000 tons of unbleached kraft paper were produced in the Western states. This indicated a record year, and prospects are that this year, 1952, will show an even further improvement.

Paper shipping sacks appear to be the fastest growing product in this area.

One trend in the industry that can be identified is the gradual turn toward use of smaller logs and more saw mill waste as a source for paper pulp. This is not a new wrinkle, but has been a gradual movement over the years as the best logs have become increasingly valuable for use in lumber and plywood.

Shipments of Paper and Board Products

Source: 1947 Census of Manufactures:
Figures in Millions of Dollars

	Pacific \$	Wash. \$	Calif. \$
Waxed paper	17.3	....	12.5
Other coated and glazed paper products	0.2	....	....
Envelopes	8.6	....	6.1
Grocers' and variety bags	11.3	....	....
Specialty bags	6.8	0.2	6.6
Shipping sacks .....	....	3.7	....
Other bags	1.7	....	....
Shipping containers	53.7	15.8	34.7
Folding boxes and cartons	27.4	....	23.5
Mountain	\$1.1	....	....
Setup boxes	8.8	1.4	6.9
Oregon	\$0.5	....	....
Mountain	1.2	....	....
Fiber cans, tubes, drums, and similar products	1.1	....	....
Filing accessories	1.0	....	....
Miscellaneous die-cut prod.	1.5	....	1.2
Stationery, tablets, and related products	3.2	....	....
Wrapping products, except coated, oiled, and waxed .....	....	....	2.5
Sanitary food containers	13.1	....	13.1
Sanitary health products	10.5	....	....
Other converted products	12.6	....	8.5

FOLDING BOXES—

FIGURES on the folding paper box industry are not available for the West alone, so we here include information on a national scale:

For the first 10 months of last year, estimated production ran 85,286 tons, with a dollar value of \$23,704,031, establishing 1951 as a peak year.

DOOR MANUFACTURING—

TWO FACTORS account for the lower-than-desired state of the door manufacturing business in the West. Primarily, slowdown of residential building took a deep slice; secondly, door styles are changing, and while the West has gone in for panel doors, manufacturers of flush doors (the new design) have been making themselves felt in the market.

Actual figures are available for only the first nine months of last year, and those figures are given as calculated estimates. During that period, door plants of the Pacific Northwest produced over 5,660,000 doors with a market value to the mills of about \$32,500,000.

By contrast, 1950 was a peak year for the industry, when those plants manufactured 10,500,000 doors with an approximate market value of about \$60,000,000.

It is expected that the volume this year will probably be greater than that of last year, by perhaps 10% to 15%. This volume increase will probably result from completion of last year's inventory adjustment period, and not necessarily from an increase in home building.

Research and Experiment

Door manufacturing firms have recently been experimenting with new types of panel door designs. These are modernized to present architectural trends. In addition, there has been considerable experimentation and development of new types of flush doors.

Some of the door producing companies are reaching into new marketing areas, and in addition to doors they are producing plywood of various types, sound-proofing material, etc.

Since most of the plants have been operating at less than capacity, there has been no stimulus to purchase of new equipment this past year.

CEDAR SHINGLES—

FIRST HALF of last year was very good. Production was heavy, price was strong, and everybody was busy.

During the latter half, though, prices dropped quite a bit. Some mills went down, or on slow time. Main reason for this is the slowdown of home building. This slowdown is not confined to the U. S.; Canada, too, also a large producer of cedar shingles, is lagging in production.

Much of this present lull may be attributed to the customary end-of-the-year non-buying activity, to hold down inventories. Shakes are doing much better, at this writing.

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Plant owners all over the West are saving time and money the Tilt-Up way. You can, too!

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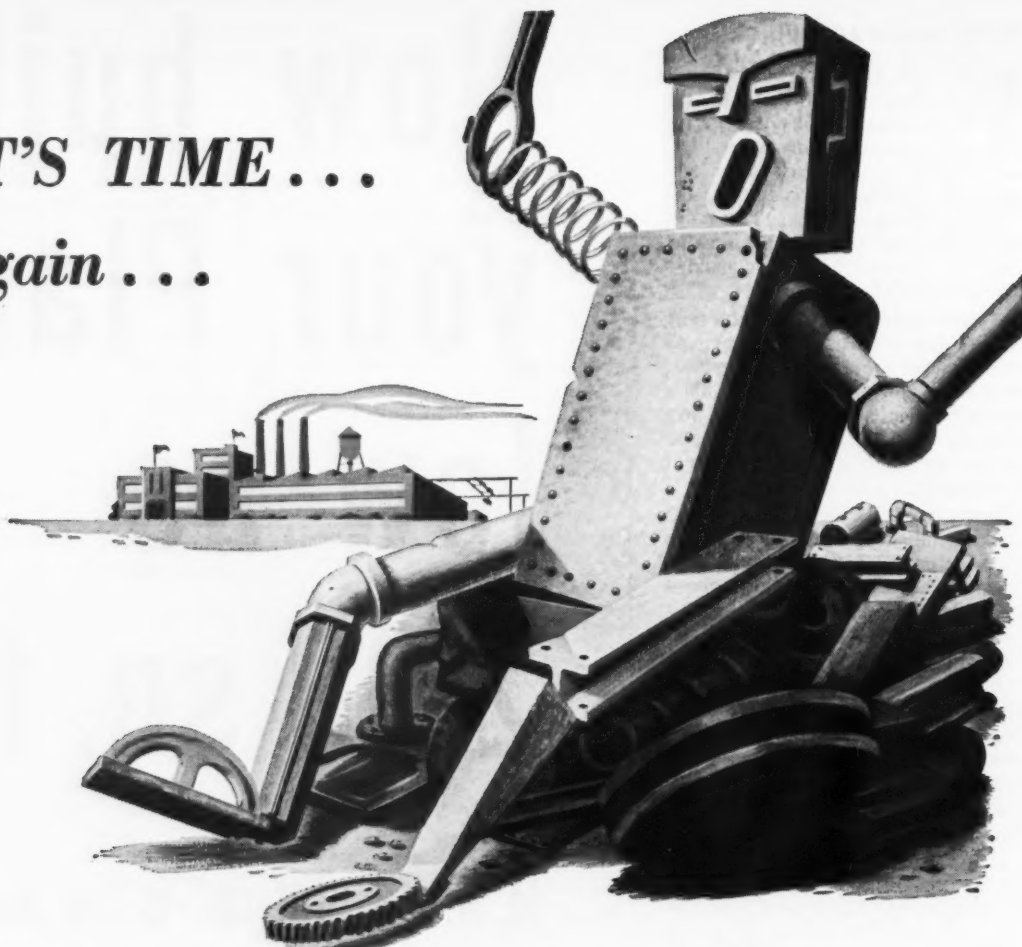
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IT'S TIME...
again...



TO WAKE UP SCRAPPY!

Scrap's getting scarce again . . . compared to the amounts we need . . . and it's up to *all* of us to *help* produce enough steel.

107,000,000 tons of steel is the present rate of production in 1951 . . . 119,500,000 tons is expected in 1952.

Last year, 1950, we produced 97,800,000 tons.

All that extra steel—enough to take care of *both* military and civilian needs—calls for *more scrap iron and steel*.

Scrap Inventories Are Alarming Low

While steel mills are producing at a greater rate than ever, scrap inventories have dwindled. Many mills are operating on a hand-to-mouth basis with shut-downs

threatened unless we furnish more scrap.

We *do* have the scrap. It's everywhere, not just in the form of *production* scrap—the “leavings” of machining, normally turned over to scrap dealers . . . but also in the form of *idle* metal: obsolete machines and tools, no-longer-usable jigs and fixtures, gears, chains, pulleys, valves, pipe, abandoned steel structures, etc.

We must have this *idle* metal to keep the furnaces running.

Please cooperate. Set up a Scrap Salvage Program in your plant—*now*. For a complete plan on “how to do it”, write for booklet “Top Management: Your Program for Emergency Scrap Recovery”. Address Advertising Council, 25 W. 45 Street, New York 19, N. Y.

NON-FERROUS SCRAP IS NEEDED, TOO!

This advertisement is a contribution, in the national interest, by

WESTERN INDUSTRY

609 Mission Street, San Francisco 5, Calif.

Why Do We Need Scrap?

Steel is made half from pig iron, half from scrap. With production on the increase, more scrap must be purchased. And it's up to you to “dig it out” and sell it.

SCRAPPY SAYS:

AID DEFENSE
MORE SCRAP
TODAY...
MORE STEEL
TOMORROW



ELECTRIC POWER—

Western demand expected to double by the end of 1960—Industrial expansion a major factor

ELECTRIC POWER demand in the West is expected to double in the decade ending 1960. The peak December load in the eleven Western States in 1950 was 11,594,000 kilowatts; the estimate for 1960 is 22,465,600. Divided up into areas, it is as follows, in thousands of kilowatts:

	1950	1960
Federal Power Commission Region 7 (Oregon, Washington, Idaho, Utah, Montana).....	4,963	10,200
Region 8 (Calif., Nev., Ariz.).....	5,950	11,000
(Wyo., Colo., N. Mex.).....	681	1,265

The immediate prospect is estimated by the Federal Power Commission as follows:

	Region 7	Region 8	Total
1951.....	5,751	6,626	12,377
1952.....	6,279	7,256	13,535
1953.....	6,902	7,858	14,760
1954.....	7,392	8,436	15,828

Meeting that demand presents a problem only in Washington and Oregon, where demand has increased faster than supply. In the rest of the West, new hydro and steam facilities are coming in fast enough to answer all needs.

But in these two states the expansion of the electro-process industries, notably aluminum, which are heavy consumers of power, has thrown the economy out of balance. This situation is due to continue until new hydro facilities are completed. Lower fuel costs, if natural gas or oil should be piped in, would change that picture earlier by making steam plants feasible.

In the California-Nevada-Arizona area, steam already has become more important than hydro, because most of the low-cost hydro already has been developed. This is reflected in the following figures submitted to the California Public Utilities Commission last year by H. A. Lott, vice-chairman of the Pacific Southwest Interchange Committee, in millions of kilowatt hours:

	Average Water Conditions		Adverse Conditions	
	Fuel	Hydro	% Fuel	% Fuel
1951*	25,730*	21,698*	54.2*	54.2
1952.....	28,441	22,478	55.8	63.4
1953.....	33,731	22,833	59.6	67.2
1954.....	44,402	22,650	66.2	73.2

* All 1951 figures are for adverse conditions, not average.

A 500-kw. limitation on each additional new load was agreed upon two years ago by the power companies in the Pacific Northwest, and since then more than 68,000 kw. of new business has been rejected, according to George Gunn, Jr., of the Washington State Industrial Development Committee.

It is widely believed that the general growth of the area will continue to be hindered for several years because so much power is consumed by the electro-process industries. But with the government pressing hard for more aluminum to meet defense program needs, there does not seem to be any immediate remedy for the situation.

Man-year kw. requirements of selected industries are given by Mr. Gunn as follows:

	Kilowatt hours
Aluminum reduction.....	1,125,000
Pulp and paper products.....	85,900
Flouring mills and feed.....	30,700
Lumbering and wood products.....	10,800
Food products.....	5,560
Furniture.....	4,040

The distribution of December 1951 peak loads in the electro-process industries, in thousands of kilowatts, is reported to be as follows:

	Total	Interruptible
Aluminum.....	803.3	191.6
Phosphorus.....	25.0	104.1
Magnesium.....	53.2	
Miscellaneous electro-process.....	141.7	
Total.....	1,023.2	295.7

RADIANT HEATING—

New industry is healthy and growing rapidly—Material shortage slowing expansion

RADIANT HEATING is a new field of industry in the West, and in this area it has been developed since 1945. Last year is without a doubt the peak of all previous years, when the industry had opportunity to expand its activities.

An unofficial survey indicated less than 1,000 jobs in April 1947, in Southern California. In 1951, a recap survey indicated in the neighborhood of 20,000 installations.

It is estimated, however, that 1952 volume is going to be about 60% below that of 1951, and that the only

Electrical Industrial Apparatus

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Calif.
Current-carrying wiring devices.....	2.4	2.4
Non-current-carrying wiring devices and supplies.....	3.5	3.5
Pole-line and transmission hardware.....	3.7	3.7
Electrical test equipment.....	2.7	2.7
Prime mover-generator sets, other than steam or hydraulic turbine.....	*3.8	....
Motor-generator sets and other rotating equipment.....	*3.0	....
Parts and supplies for motors, generators, and motor-generator sets.....	....	0.5
Specialty transformers.....	1.7	....
Switchgear and switchboard apparatus.....	*22.4	20.3
Washington.....	\$1.7	....
Industrial electrical control equipment (except railway and motor vehicle controllers)....	2.9	....
Arc welding machines, welding parts, components, and accessories.....	*1.2	....
Miscellaneous electrical equipment for industrial use.....	2.5	....

* Pacific and Mountain Divisions combined.

Electrical Appliances

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Calif.
Electric water heaters.....	12.6	5.0
Small electric appliances, except fans.....	16.3	16.2
Domestic ranges, electric.....	*2.5	....
Commercial cooking and food warming equipment, electric.....	*1.2	....

* Pacific and Mountain Divisions combined.

Miscellaneous Electrical Products

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Oregon	Calif.
Starting, lighting, and ignition (S.L.I.) storage batteries.....	*31.2	3.3	26.2
Electrical products, n.e.c.	0.8	....	0.8

* Mountain Division is included with Pacific Division.

improvements to be developed will be on existing products rather than on development of new products.

Long range plans indicate that new marketing areas may be touched, but not for some time. As long as the defense program is under way, and materials are allocated, this field will probably experience difficulty.

At this writing, here is a result of changes of raw materials used in the industry: copper pipe has been switched to steel and wrought iron pipe. Control material is reduced. Some lines have been shelved. Alloys, formerly used in radiant heating, went the way of Lucky Strike Green in the last fracas.

Labor shortages that are now in the offing will probably be offset by employment of women.



FRACTIONATION and polymerization equipment at Carter Oil Co. refinery, Cut Bank, Mont.

THE WEST'S PROBLEM of too much heavy oil, too little gasoline, has been partially solved. War in the Pacific has drawn off the surplus of fuel oils, while new catalytic cracking plants have begun to convert heavier crudes into gasoline. Instead of shutting down fields producing low-gravity petroleum, as has been happening in the past two years, the industry has begun to reopen them and go looking for more.

Meanwhile the world crisis has touched off a new wave of prospecting. Bonanza discoveries in Montana, the Dakotas, and western Canada still have not balanced up the West's mounting requirements. In 1951, U. S. drilling hit an all-time high of 44,000 wells, but the industry will sink 50,000 in 1952 if it can get the steel.

Shortages May Come

In the West, where wells are deepest, shortage of oil-country pipe have caused abandonment of many stripper wells to reclaim the pipe for further exploration. Unless new sources can be found, the West may well face short supplies in 1952, although gasoline rationing at this point does not appear imminent.

The Bureau of Mines forecasts a 5% increase in the nation's need for oil during 1952, on the assumption that imports will rise sharply during the last part of the year. Some 5,400 new wells are expected to be drilled in the free nations outside the U. S., raising their output about 9%. Canada will drill some 2,000, Venezuela about

1,424. Our own exports should decline about 28%, says the Bureau.

The industry in the Rocky Mountain area is having a sensational development on the exploration and drilling side, with its Williston Basin and Denver-Julesburg Basin discoveries holding national attention of the industry.

Production is held back by incomplete pipeline outlets to markets, due for completion in the spring of 1952. However, production has inched up somewhat with expansion of the region's own refining capacity.

High Output

Output at the end of July in a 5-state area (Wyoming, Colorado, Nebraska, Utah and Montana) of the region was at the rate of 290,585 barrels a day and has held approximately that level since then, possibly breaking the 300,000 mark during the last couple of months of 1951.

This compares with daily production of 272,908 barrels daily in July 1950 and 140,000 barrels daily in 1941. These figures cover only a portion of the Rocky Mountain region, omitting small production from northwestern New Mexico and very large production on the Canadian side of the Rocky Mountain area, now moving by pipeline to the Great Lakes area at the rate of approximately 100,000 barrels a day.

Completion of the Platte pipeline from north-central Wyoming to the St. Louis refinery area on the Mississippi will be in the early spring, and will add at least 90,000 barrels daily to the region's oil output.

More than \$200,000,000 will be

spent in the Rocky Mountain-western Canada area in 1952 in exploratory drilling and development, by a dozen of the largest oil companies and some two hundred smaller operators.

Colorado's Rangely field continues to lead Rocky Mountain fields on the U. S. side, with Alberta's Redwater field far in the lead on the Canadian side.

Unless adverse market conditions cause a cutback (possible only if "total peace" should be declared) oil production in the Rocky Mountain area (U. S. side only) should almost double in 1952. So far there is strong demand for the product at good prices, proved reserves are ample and growing fast, and production has been held down only by lack of transportation facilities.

Drilling Gets Cheaper

It seems that the geophysical prospecting experts are "getting the range" at last. Recent successes in the Williston Basin, San Juan Basin, Denver-Julesburg Basin and elsewhere in the area have been scored in areas that would defy even the best of the old-fashioned geologists using surface geology alone.

Many dry holes have been drilled using geophysical methods to pick the locations, but it seems that recent tests have been scoring a remarkably high return. There is a possibility that these modern "doodle bugs" have solved one of the oldest problems—finding subsurface mineral deposits, when there are no surface indications that such deposits exist.

Strangely, drilling costs are going down. In the plains area where much

PETROLEUM—

War activity uses all oil surplus.

Increase noted in nation's 1952

petroleum needs. Drilling costs

now going down. Steel shortage

plagues pipeline building

drilling now is being done, a well that would have cost \$40,000 ten years ago now can be drilled for \$35,000 or as little as \$30,000. Improved practices, better equipment and more "know how" have accomplished this.

The unions now are opening a strong drive to boost oil workers' pay, based on the claim that they should get some benefit from reduced drilling costs and higher man-hour productivity. The oil companies are in such good financial position they must yield to these demands, work out an entirely new scale of compensation.

One of the serious problems at the moment is not merely the scarcity of steel for casing, line pipe and drill pipe but also shortage of steel, alloys, chemicals, rubber and other products used in oil and gas operations. "What good is casing if you haven't got drill bits?" Oil men are joining the suppliers in demanding better distribution of scarce materials for these miscellaneous products, as well as for pipe.

24-inch Pipeline

Available supply for all the Coast states will be augmented by a 24-inch pipeline from Edmonton, Alberta, to Vancouver, B. C., for which contracts have just been let. Its initial capacity will be 75,000 barrels a day, equivalent to practically all of British Columbia's present consumption, and the gasoline and other petroleum products now imported from California into British Columbia will be available for Washington and Oregon. Ultimate capacity of the pipeline is 200,000 barrels.

GAS—

Customers keep coming and consumption keeps going up, largely in the domestic field

GAS UTILITIES (particularly in California) are continuing to experience very rapid growth. Customers increased about 6% in 1951 over 1950, cubic foot sales stepped up about 15%, and revenues were about 20% greater. All these are new highs.

Increase in number of customers comes largely in the domestic field, resulting from a continued influx of new residents. But while both sales and revenue have increased in that field, they have increased at an even greater rate in both the commercial and the industrial fields.

Revenue increases, it should be noted, are somewhat influenced by rate increases on the part of most gas utility firms reporting.

Volume sales during the last two or

three months of the year are dependent to a large extent on how cold the weather gets, since house heating influences that figure greatly.

Last year's news item of most importance was the completion of pipe lines bringing in out-of-state gas to California. All of the lines coming into the state from New Mexico and Texas should be operating at full capacity by the first of this year, complete with necessary compressor plants. The gas supply situation seems to be fully adequate, at least for the time being.

A natural gas supply for the Pacific

Northwest is still undetermined. Prospects look good. It is very possible that the Province of Alberta will grant an export permit to some company before too long. If this should happen, the extremely tight situation in that area will cause quick action in securing the pipe and building the line.

Efforts to import natural gas from Alberta into the Pacific Northwest continue. Hearings on four applications of this nature, plus two more for Winnipeg and eastern Canada, before the Alberta Petroleum and Natural Gas Conservation Board were con-

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SS-192

cluded in December. They will probably be submitted to the Alberta legislature in February. Montana Power Company's application to import gas to serve Anaconda Copper Company is being bitterly contested by the United Mine Workers, who fear that it is merely the entering wedge for gas throughout the Northwest which unquestionably would displace coal.

As to the effect natural gas would have on fuel costs, various applicants gave estimates during the Alberta hearings of average cost of natural gas on the Coast between 32 cents and 35 cents per Mcf.

GAS APPLIANCES—

Western manufacturers now serving national market. Raw material difficulties increase

IN CALIFORNIA, there has developed a very important gas appliance manufacturing industry whose total production is now far in excess of Pacific Coast needs. Many of these manufacturers have expanded into a national market.

Sales of gas ranges and water heaters for 1951 were somewhat less than

in 1950, but sale of gas heating appliances somewhat greater. Year 1950 was a record year in practically all classifications of appliances, with sales being influenced by the scare buying in the fall of that year.

So far, there has not been too much difficulty in obtaining raw materials to manufacture these items, but this difficulty is increasing and will probably have considerable influence on appliance production this year.

A steady improvement is noted in all appliances, a natural result of normal competition, but also swayed by the continual upgrading in safety and quality resulting from the social consciousness of the industry working through the American Gas Association Testing Laboratory.

During 1951, two manufacturers brought out distinctly new gas cooking devices, embodied in built-in ovens and broilers separate from top burners, which can be located at any point in the kitchen.

Other manufacturers made distinct contributions in the production of very efficient gas clothes dryers and garbage and waste disposal units, which first dry out the garbage and then reduce it to ash without producing smoke or odor. These appliances will undoubtedly achieve a wide popularity if materials can be obtained to make them.

During this year coming up, if defense conditions permit, a second gas refrigerator manufacturer will enter the market.

COAL—

Production is down; car shortage and railroad diesel operation are contributing factors

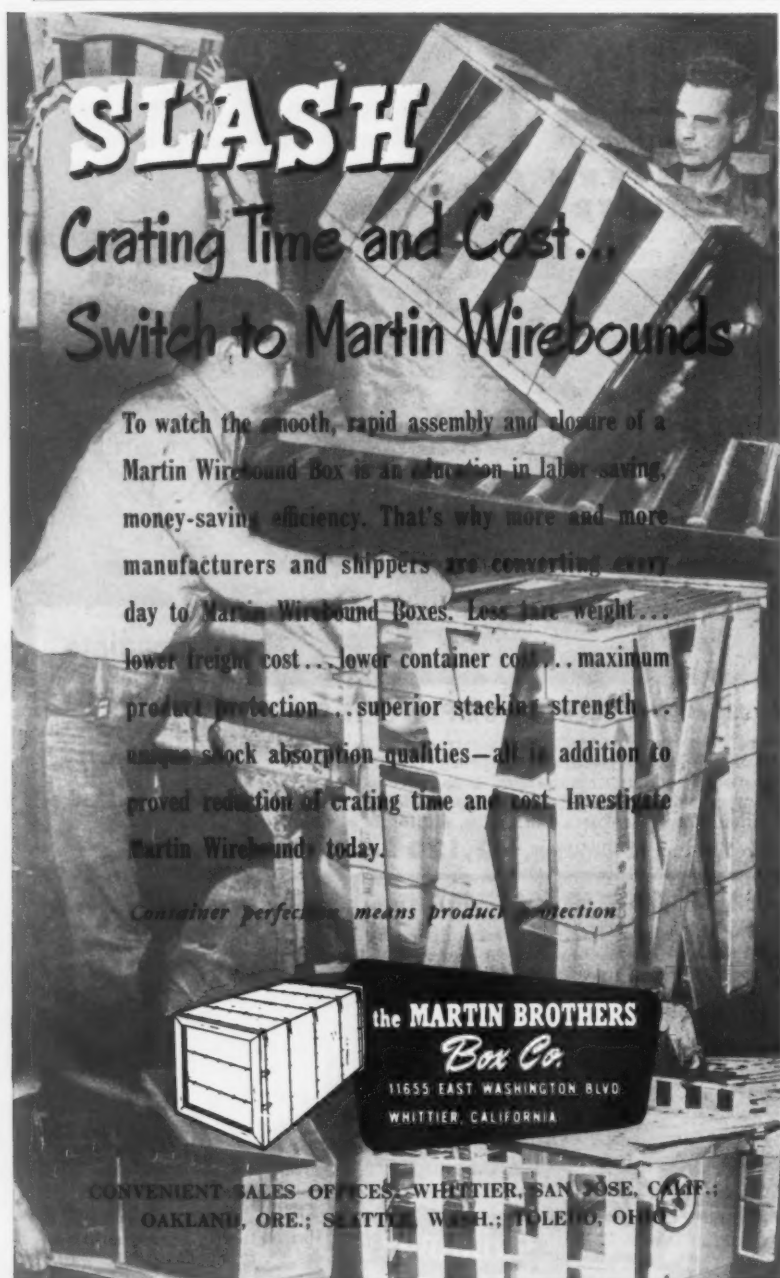
COAL PRODUCTION in general throughout the Western states has been off a bit during 1951 from previous years. Shortage of railroad cars was one factor contributing to this loss in production.

Railroads' decision to convert to diesel engines has registered an impact on coal production, too.

Demand for coal was, in some sections, as great or greater than that of 1950, but the commercial mines were unable to accept orders because of the car shortage.

A natural result of this was (1) short work weeks, (2) frequent lay-offs, and (3) migration of skilled miners into other sections or industries. Normal employment in mines during 1951 was less than that during 1950, in some sections.

Another result of this situation is the gradual appearance of mechanical



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apparatus to do the mining job. In Utah, for example, the mines are now fully mechanized, and Utah's mines are developed and equipped to produce at least twice as much coal as they were able to ship during 1951.

WESTERN RAILROADS—

All lines purchase freight and diesel equipment—May mean a change in fuel consumption

LAST YEAR was a good year, volumewise for Western railroads, though not a record one. On basis of present outlook, this year should equal last, but whether it will or not depends on developments that can not now be foreseen clearly.

Western railroads all have been heavy purchasers of freight cars and Diesel locomotives during the past year, but accurate figures are not available. More extensive use of Diesel locomotives is going to mean some changes in types of supplies and fuels used.

Material scarcities related to the defense program are likely to interfere some with progress toward wider use of new mechanical methods in production operations.

During the last year, labor union contract provisions required adjustments in the railroads' operating methods to fit the 40-hour week. What new facets of labor union activity are coming up depend almost entirely upon outcome of negotiations now in progress at Washington on demands for changes in working rules. These demands have been under negotiation for more than a year now, and an end is not yet in sight.

SUGAR—

1950 still holds the production record — Forecast is difficult

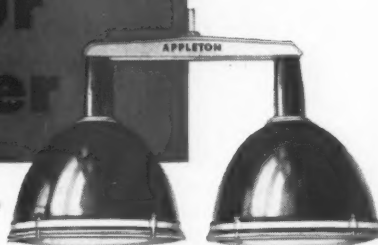
AT THIS WRITING, accurate figures on the sugar industry for 1951 are not yet available. Harvesting of sugar beets started late. However, present indications do not give signs of equaling the peak production of 1950.

Forecast for 1952 is likewise difficult, since contracts between growers and processors are not signed (in many cases) until well into the spring of that year.

By way of improving the industry during 1951 it may be noted that in three factories, about \$1,000,000 was spent in new equipment.



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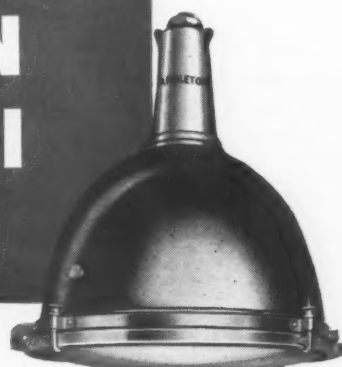
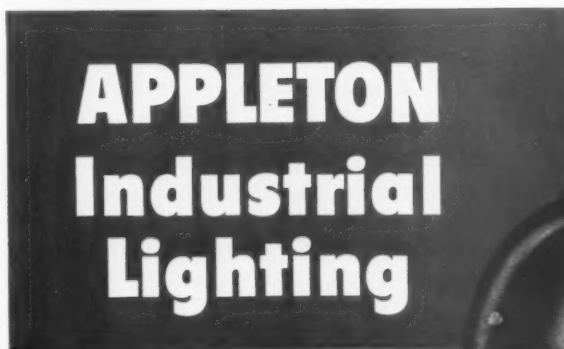
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FOOD PRODUCTS—

All-time record last year in vegetable and fruit canning, with credit to the growers

THE WEST'S BIG and highly mechanized fruit and vegetable canneries, which have no counterpart elsewhere in the world, exceeded all previous outputs in 1951, not because of further expansion and mechaniza-

tion, but because growers have greatly increased their yields through fertilization and other improved horticultural practices.

For example, the California pack of cling peaches, the dominant product in

the state, was more than 19,000,000 cases, about 2,000,000 cases above the previous all-time high in 1946. One reason for the large crop was the fact that the preceding winter was so mild the trees did not become dormant, thus upsetting an old axiom that this dormant condition was essential to producing a good crop next season.

In tomatoes, the California yield averaged 16 tons per acre, compared to 14-14½ tons in 1947 and around 8 or 9 tons a decade ago. This resulted in California packing 2,000,000 tons, more than half the nation's tonnage—a long jump forward from earlier years, when California only accounted for about 20% of the nation's output of tomatoes and tomato products. Probably a larger proportion than ever before went into tomato products rather than straight canned tomatoes.

Mechanization

Steam peeling and mechanical coring of tomatoes became more prevalent last year, and one proof that canners have not stood still in improving their production methods is that Schuckl & Co., who have always been recognized as one of the most efficient among the quality group of packers, had a lower man-hour cost per thousand cases of canned fruit and vegetables in 1951 than ever before.

Another development that may have revolutionary implications is the adoption by Hunt Foods of a single-grade pack, instead of the time-honored fancy, choice, standard, water, pie and various "extra" grades, which obviously require more sorting and segregation equipment, to say nothing of labels and other incidentals. Hunt Foods also have abandoned processing fruits and vegetables in the customary cookers and have reverted to the old-fashioned horizontal cylindrical retorts, modernized by opening the rear end to permit a once-through trip which, coupled with the use of lift trucks to eliminate handling, has produced phenomenal efficiency, according to their reports.

Frozen Foods

Output of frozen foods continues to grow in the West, with a trend toward smaller sizes of packages, i.e., 10-oz. and 12-oz. packages instead of 16-oz. Where B-grade products previously had gone mostly into institutional size containers, packers are now making more profit for themselves by packing B-grades for retail consumer use in the cut-price range. Whether this will create a vacuum in the institutional field which will restore canned foods to their primacy in that area remains to be seen.

SHAPES



OLD ROLL FORMING

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Automatic packing lines are on the increase, speeding up packing and sealing, and making one-girl operations possible instead of the previous three-girl or four-girl setup.

California frozen vegetable pack in 1950 was 140,452,428 lb. and fruits 80,419,219. 1951 figures not yet in.

The California Fruit Growers Exchange (Sunkist) have gone into frozen orange concentrate full force, but their advertising and promotion efforts so far do not seem to have proved that customer acceptance of Sunkist as a quality label in fresh fruit has been extended to the canned concentrate. In frozen lemon concentrate, however, tremendous marketing strides have been made, indicating that this item may become a year-around seller.

Licking the Freight Problem

Increasing spread between glass and tin threatens to diminish the volume of products packed in glass. One experiment in overcoming freight costs in reaching distant markets was by Val-Sweet Sales in shipping grape juice in tank cars from California to Indiana for canning. It is expected that the Texas market will be reached by the same method this year.

Dried Fruits

Dried fruits, which have always suffered from an inferiority complex, demonstrated last year in sales tests in Grand Union and First National stores in New York a tremendous increase in volume and in profits per square foot (the supermarket yardstick) when placed next to fresh fruit and produce instead of being relegated to less attractive positions.

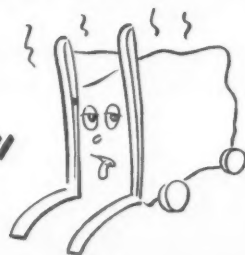
Abrasive, Asbestos, and Miscellaneous Nonmetallic Mineral Products

1947 Production—In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Mtn.	Utah	Pacific	Calif.
Non-metallic abrasives.....	.....	0.4	.....	.....
Buffing and polishing wheels and laps (containing no abrasives).....	.....	0.1	0.1	.....
Asbestos friction materials.....	.....	0.7	.....	.....
Other asbestos products, n.e.c. ....	.....	0.4	.....	.....
Gaskets.....	.....	2.2	2.2	.....
Packing (except leather, rubber, and metal).....	.....	0.3	0.3	.....
Asbestos insulations.....	.....	3.0	.....	.....
Lightweight aggregate (except vermiculite).....	0.3	.....	8.2	.....
Other minerals and earths: ground or otherwise treated.....	1.3	0.4	5.8
Nonclay refractories.....	0.9	7.5

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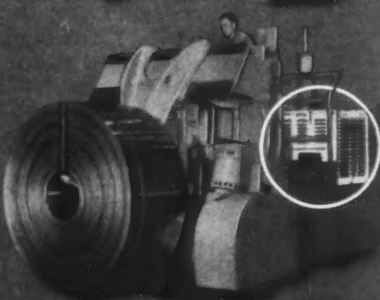
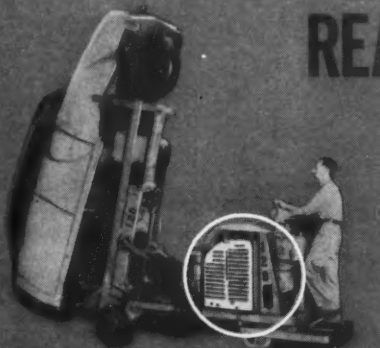
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NON-FERROUS METALS—

A vigorous Western market is being recognized by major copper and copper alloy producers

WITH ITS rapidly increasing population, the Pacific Coast States have become an important market for copper and copper-base alloys.

Two of our member companies during recent years have built three plants in the state of California. Two of these are located in Los Angeles where copper and copper-base alloy mill products are produced and the third at Riverside where related products are manufactured. In addition many of our member companies have established warehouses and sales offices in the states of Washington, Oregon and California.

During 1950 there were used by fabricators of basic copper and copper-base products in the United States approximately 1,400,000 tons of copper. The largest consuming industries are in the electrical field which includes telephone and telegraph, light and power.

Second largest is the automotive industry, with the building field running a close third. Some of the others have included radio and television; refrigeration, air conditioning, shipbuilding, the railroad field, clocks and watches, ammunition, radiant heating and radiators.

Copper Shortage

With the Government stockpiling copper for its rearmament national defense program, the increased demand for copper abroad and the stoppages in mining by strikes, there has developed one of the gravest copper shortages in the history of our country. Before World War II the United States used about 600,000 tons a year as against the 1,400,000 tons for 1950. This copper is produced in the copper mining states of our country and imported largely from mines in South America, Mexico and Canada, many of which are at least in part owned and operated by Americans.

What makes the copper shortage even more critical is the shortage of scrap. An inter-industry committee is now being considered in an effort to have scrap in this country returned to the various users, as quickly as possible, through the established channels, so that the various basic products can be made in the volume required.

By
**BERTRAM
B.
CADDLE**

Secretary
Copper and Brass
Research
Association



Western Copper Smelters and Refineries

PLANTS THAT TREAT PRIMARY CRUDE MATERIALS EXCLUSIVELY OR CHIEFLY

From 1950 Yearbook, American Bureau of Metal Statistics

	Capacity (tons of charge)	Final Product
ARIZONA		
Ajo (Phelps Dodge).....	300,000	Blister
Morenci (Phelps Dodge)	900,000	Blister
Douglas (Phelps Dodge)	1,250,000	Blister
Hayden (Phelps Dodge)	300,000	Blister
Inspiration (Inspiration Consol. Copper)		Electro- lytic
Miami (Intl. Smelting)...	360,000	Blister
Superior (Magma Copper).....	250,000	Blister
MONTANA		
Anaconda (Anaconda Copper)....	1,000,000	Blister
Great Falls (Anaconda Copper)....		Electro- lytic
NEVADA		
McGill (Kennecott Copper)....	450,000	Blister
NEW MEXICO		
Hurley (Kennecott Copper)....	288,000	Blister and fire refined
TEXAS		
El Paso (American Smelting) ..	300,000	Blister
(Phelps Dodge).....		Electro- lytic and fire refined
UTAH		
Garfield (American Smelting) ..	1,608,000	Blister
(Kennecott Copper)....		Electro- lytic
Tooele (Intl. Smelting)...		Blister
WASHINGTON		
Tacoma (American Smelting) ..	675,000	Blister and Electro- lytic

Like copper, scrap abroad is in great demand and our flow from that source diminished.

National Defense will have first call on copper and copper-base alloys during 1952 with the result that there will be less of the red metal and its many alloys for peacetime industries. This will probably result in fewer automobiles and homes built during 1952 and the manufacture of considerably less household appliances such as electric irons, vacuum cleaners, kitchen mixers, etc.

Millions of pounds of copper and its alloys will be used during 1952 for the manufacture of munitions for our armed forces; for construction of fighting planes, fighting ships and submarines, tanks and other armament for our own fighting men and for other countries of the United Nations, with the exception of Russia and her satellites behind the Iron Curtain.

Down to the Penny

A striking example of the acute copper shortage is the fact that there are not enough copper pennies in circulation for merchants to "make change." This is largely due to taxes—government, state and municipal—where an item like cigarettes, for instance, sells for 21 cents a pack, requiring four copper pennies in change.

By legislation passed in 1864, United States pennies must contain 95 per cent copper, plus a 5 per cent mixture of tin and zinc. It is estimated that there are some 18,367,792,533 pennies outstanding, which, however, does not signify an equivalent number in actual circulation.

During World War II when the United States needed every pound of copper for the manufacture of munitions for our fighting men and our Allies, zinc-coated steel pennies were struck in 1943. These were very unpopular and such minting was discontinued after that year and most of this mintage was retired when turned in.

Hot Search

The National Production Authority is leaving no source of copper untapped. That agency believes motion picture projectors in the 20,000 movie theaters in this country may turn up as much as 100,000 pounds of the red metal annually. Carbons used in the projectors are copper-coated providing greater light intensity. Heat from the arc lamps in the projectors melt this coating into drippings that have a copper content of about 94 per cent. Now, after the projectionist has rewound his film after the closing performance, he has to sweep up the copper drippings as a conservation measure.



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CHEMICALS—

New chemicals now Western-produced to serve a market that is here — Some deficient production

MAJOR EXPANSIONS in various fields announced or started in 1951 served to fill in some of the gaps previously existing in the Western chemical industry, while the reactivation of the synthetic rubber plants in southern California revived a wartime product that had faded entirely out of the Western picture.

Among these are the phenol and benzene plant of Standard Oil Company of California at Richmond and the Shell Chemical benzene plant supplementing the small supply heretofore available only from Portland Gas & Coke Company. Besides these key-stone products of the organic chemical industry, Hancock Chemical Company announced an ethylene glycol plant, the first of its kind in the West.

Great strides also were made in 1951 toward self-sufficiency of sulphur supplies, by recovering sulphur from refinery gases and developing supplies of sulphuric acid from the roasting of pyrites. In the phosphorus line three multi-million dollar plants were announced, and major expansion in potash. Chlorine expansion included at least four important Western projects; present production in the West is estimated by The Chlorine Institute at 600 tons of chlorine gas per 24-hour day in a seven-day week.

Greater supplies of resorcin have become available from the new Borden operation at Dominguez. Previous main Western source was the AS&R copper smelter at Tacoma. Shell has doubled its polystyrene capacity at

Long Beach, Calif. By-product coke from the Fontana steel mill is another new Western chemical supply. Citric acid by fermentation of molasses is still another product. More pharmaceuticals will become available from the expanded Marine Magnesium Products plant at South San Francisco.

Some Shortcomings

Among remaining Western major deficiencies are methanol, formaldehyde and vinyl chloride. On the other hand, petrochemicals such as detergent intermediates, para xylene, acetone and isopropyl alcohol are exported, according to President G. L. Parkhurst of Oronite Chemical Company, in a report to the American Chemical Society.

Dr. Raymond Ewell of Stanford Research Institute, whose tabulation of Western chemical consumption accompanies this report, gives the usage of packaging materials in the Western food processing industry as \$24 million, synthetic vitamins at \$10 million and synthetic flavors at \$7 million.

In surface coatings, \$22 million each of pigments and resins are used, he says, and \$20 million of solvents. The petroleum industry uses \$32 million of anti-knock agents.

In agriculture, \$28 million went for nitrogenous fertilizer materials, \$8 for phosphorus fertilizer materials, and \$20 million for insecticides, sprays, etc.

Dr. Ewell figures that the rubber industry in the West used \$22 million in synthetic rubbers and \$18 million in rayon, plus \$6 million in pigments. In the lumber industry the figure was \$6 million each for wood preservatives and plywood adhesives.

For metal fabricating, his figure was \$1.5 each for degreasing solvents and gases for welding and cutting, and \$1 for acids.

California production of ethyl alcohol for 1950 is reported by the government as 7,531,471 gallons. Oregon output was 82,477 gallons, and Washington's 5,593,640.

Soda ash consumption in the San Francisco Bay area has been estimated at 53,000 tons for 1950, divided as follows: glass, 20,000; sodium silicate, 25,000; soap and cleansers, 3,000; sodium phosphate, 5,000. This is all supplied from Searles and Owens lakes. Pacific Northwest consumption is figured at 10,000 tons, mostly sodium silicate for plywood adhesives. Eleven Western States' production is estimated at 300,000 tons, with considerable of the Wyoming tonnage going East.

CHEMICAL CONSUMPTION OF LEADING INDUSTRIES

1950 — In Millions of Dollars

Western Rank	Industry	Western Consumption	Per Cent of National	National Rank	Principal Chemicals Consumed in West
1.	Food processing	67	26.8	(8)	Packaging films, synthetic vitamins, flavors, acidulants, preservatives, refrigerants.
2.	Surface coatings	65	10.8	(3)	Pigments, resins, solvents, driers, plasticizers.
3.	Petroleum	59	15.7	(6)	Anti-knock agents, acids, alkalis, catalysts, solvents, lube oil additives.
4.	Agriculture	57	10.9	(4)	Fertilizers, insecticides, other pesticides, livestock sprays, plant hormones, defoliants.
5.	Rubber	52	8.0	(2)	Synthetic rubbers, rayon, accelerators, anti-oxidants, pigments, peptizers, activators.
6.	Mining and smelting.....	20	16.6	(10)	Explosives, flotation agents, acids, alkalis, fluxes.
7.	Pulp and paper.....	15	16.6	(12)	Sulfur, salt cake, caustic soda, soda ash, chlorine, resins, pigments, dyes.
8.	Lumber	13	26.0	(15)	Wood preservatives, plywood adhesives, insecticides, barbiticides.
9.	Soap and cleansers.....	11	.8	(9)	Synthetic detergents, alkyl aromatics, caustic soda, builders, alkalis, CMC.
10.	Plastics fabricating.....	9	2.2	(5)	Molding powder, sheeting and film, rods and tubes, resin emulsions.
11.	Pharmaceuticals	7	2.1	(7)	Anti-biotics, hormones, sulfa drugs, vitamins, pain-killing drugs, antiseptics.
12.	Metal fabricating	7	.7	(11)	Degreasing solvents, acids, welding and cutting gases, electroplating chemicals, core binders.
13.	Automobile servicing	7	8.7	(13)	Anti-freezes, hydraulic fluids, carbon removers.
14.	Laundry and dry cleaning..	5	(not compiled)		Dry cleaning solvents, alkalis, bleaches, soaps, bluing, emulsifiers.
15.	Storage batteries	4	(not compiled)		Litharge, red lead, sulfuric acid.

(Compiled by Raymond H. Ewell, manager, Chemical Economics Service, Stanford Research Institute, for Industrial and Engineering Chemistry)

GLASS—

The West uses much more than it produces, in glass containers. More efficient machines help

IN THE WEST, at least at the present time, there is not sufficient productive capacity in the manufacture of glass containers to supply current demand. For example, with the exception of limited production by one plant in California, no milk bottles are produced west of Oklahoma—and although the demand has decreased in recent years, this product still constitutes a large market for glass manufacturers.

It is estimated that national production of glass containers for 1951 will slightly exceed the peak year (1946) when it totaled 116,000,000 gross tons. About 10% of the national figure is Western-produced. Hence, continuing the estimate, this would amount to 32.4% above our post-war low of 1949, and 9.4% ahead of 1951. This year's volume should be about the same as 1951.

Swing to Glass

No new products are being brought out, but sales of the one-way non-returnable beer bottle are running about four times that of 1950. If steel continues short, it is expected that non-seasonal foods such as coffee, shortening, spaghetti and meat balls, fruit cocktail, etc., will swing more heavily from cans to glass containers.

No general trend can be identified in installation by manufacturers of new types of plant equipment, though several older style glass forming machines have been replaced with newer, more efficient machines on the West Coast during the past year.

Labor will have a bearing on costs henceforth, since most plants will close down for six holidays during the year as a result of the granting of paid holidays in September 1950. This pyramids costs.

Glass Products

1947 Production—In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific \$	Wash. \$	Calif. \$
Laminated glass	*0.3	....	....
Domestic shipments of machine-made glass containers	*46.6	....	....
Lighting glassware	0.3	....	0.3
All other pressed and blown glassware	2.4	....	2.4
Mirrors	*4.3	0.3	3.1
All other products of purchased glass	2.9	0.2	2.7
Mountain	\$0.2		

* Mountain Division is included with Pacific Division.

Concrete, Gypsum, Mineral Wool, and Stone Products: Lime

1947 Production—In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Concrete Block and Brick	Concrete Pipe	Other Precast Concrete Products	Gypsum Products	Lime	Mineral Wool	Cut- Marble Products	Cut- Granite Products
Mountain	7.9	3.7	1.3	6.4	2.2	0.7	....	0.3
Montana	0.7	....	....	....	....	....	....	....
Idaho	0.9	0.5	....	....	....	....	....	....
Wyoming	0.1	....	....	....	....	....	....	....
Colorado	2.1	....	0.3	....	....	....	....	....
New Mexico	0.7	....	0.1	....	....	....	....	....
Arizona	2.2	1.0	0.3	....	....	....	....	....
Utah	1.0	....	0.6	....	0.4	....	....	....
Nevada	0.2	....	....	....	....	....	....	....
Pacific	11.6	26.7	6.8	14.1	4.3	2.4	0.7	1.2
Washington	2.5	2.8	0.1
Oregon	1.2	1.4
California	7.9	22.5	4.9	14.1	0.7	0.6

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SINCE 1898

ALUMINUM—

Entire industry's immediate future depends on Government's CMP., from producer to fabricator

IN RETROSPECT (1951) as well as in prospect (1952) the one big factor affecting the aluminum industry is the government's Controlled Materials Plan.

This is true in all phases of the industry, from the primary producer to the smallest fabricators. In the latter months of last year, CMP restrictions

bore very heavily upon fabricators, particularly those whose facilities are not well adapted to conversion to defense subcontract work.

There are numerous such firms, whose allocations of metal for the final quarter of last year and the first quarter of this year are below the breakeven point. Uncertainty of getting metal makes it impossible for them to plan their operations efficiently.

Likewise, this scarcity situation has hindered development of new Western-produced aluminum items. Some such items, that were just getting into production and showing signs of wide

market acceptance, have been throttled by lack of metal to produce them. It is questionable if manufacturers of such items will be able to stand enforced shutdowns for any extended period of time.

On the brighter side of the aluminum picture is the industry's expansion, by the major producers. By the latter part of this year, the general supply of aluminum (not confined to the West) will be tremendously increased.

Kaiser has expanded at Mead, has increased the output of both Mead and Tacoma, and has made various improvements at the Trentwood Sheet Mill.

Alcoa should have its new primary operating capacity at Wenatchee under way sometime this year.

Reynolds is increasing the output of its two Northwest plants.

But the big news in this industry is the 1951 entry of a newcomer: Anaconda, at Kalispell, Montana, to the tune of \$46,000,000 (including a reduction plant projected, probably on the seaboard at Everett, Washington.)

Things to Come

Not only is this a new aluminum plant for the West and a new factor in primary aluminum production, but it has immense implications in respect to the future market potential of aluminum. Here is a great copper company hedging against the continuing tight availability and a rising cost of copper by getting into aluminum production itself.

New Fields

Today's overall metal situation is accelerating the extension of aluminum into fields that have been primarily copper. For example, aluminum cable and wire, which have become the leader in high voltage transmission lines previously, are now moving much faster into secondary distribution and service drops. This is being actively encouraged by the government, because of the growing availability of aluminum and the tightening of the copper situation.

Similarly, replacement of copper in such items as automobile radiators, heat exchangers, automobile wiring and lighting, is the subject of concentrated work. Western plants are now using aluminum instead of brass light sockets, and lamp bases. It seems safe to predict that the properties of aluminum as a conductor of heat and electricity will be used to good industrial advantage at a much faster pace.

All this means that, although the West Coast's share of the national alu-

PLANT REPORT

16,320 holes tapped per 8-hour shift with one machine...every one lubricated with Norgren Oil Fog. 51 taps per chucking.

INSTALLATION:

New type tapping machine built by the Snyder Tool and Engineering Co., Detroit, for use by one of the "big 3" automobile manufacturers. The machine taps 51 holes in an engine block at one chucking; taps 40 blocks an hour; replaces 4 machines in the production line.

PROBLEM:

To obtain uniform lubrication and cooling of all 51 taps and eliminate the use of a messy coolant system.

SOLUTION:

Use of a Norgren Oil Fog Lubrication System consisting of air filters, air pressure regulators, Oil-Fog Lubricators and aerosol distributors. Solenoid valves control intervals of oil-fog distribution to the taps.

RESULTS:

BETTER TAP HOLES...

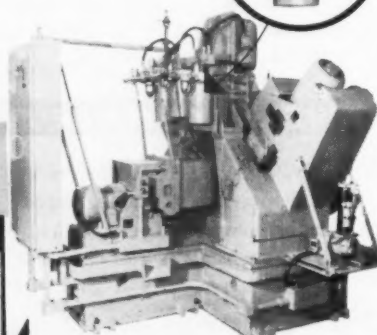
...oiled air lubricates, cleans, cools all 51 taps.

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minum capacity will be smaller percentage-wise in the future (new plants are being built by major producers in other areas), the actual production in tons will be increased.

Therefore, in the long run, Western users of aluminum are in the fortunate position of having supplies in their own area that are far greater than any conceivable consumption. The West will never be dependent upon Eastern production of aluminum, as it has had to be in the case of steel and some other basic materials.

In recent months, the big aluminum consumers have been the aircraft plants and their subcontract firms. They will continue to be so during the coming year. One noteworthy offshoot of this program has been the widening of subcontracting to areas more distant from the aircraft centers of San Diego, Los Angeles, and Seattle.

Subcontracting Decentralization

Growth of subcontracting in the San Francisco Bay region is a good example. (Note: Kaiser is establishing a good sized manufacturing facility in this area to produce aircraft sections.)

This means that more plants and workers are becoming skilled and used to working with aluminum. It was World War II aircraft production that sparked the great growth of Los Angeles as an aluminum fabricating center since 1945. The same thing may be expected on a larger scale and over a wider area as a result of the present defense program.

Among the fabrication techniques that have gained great prominence in the West during the past year are: stretch-forming by hydraulic press, use of shielded metal arc, inert gas welding with continuous consumable electrodes, adhesive bonding, and the employment of huge milling machines to fabricate integrally stiffened wing surface sections for aircraft.

Domestic production of primary aluminum in 1950 was 718,622 short tons, an increase of 19 per cent over 1949. Around half the total production is in the West.

FISH—

SALMON pack under normal, due to higher prices, and government's restrictions of areas and hours. Sardines below 1950, Southern California becomes the big producer. Tuna pack may have equalled 1950 peak; imported tuna in brine from Japan leaps tariff wall, and several tuna canneries had to shut down, with the competition of cheap Japanese imported tuna ascribed as the cause.

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"We moved in eighteen tractors as power units and the necessary Carryalls, Sheep Fooths, Jeeps and other equipment. As soon as we removed the upper crust there was nothing but peat and marsh to run on. Trac-

tors would sink in over the track rolls. To keep equipment rolling would require a special lubricant.

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CLAY, BRICK and TILE—

Further mechanization will aid brick manufacturers. More use materials handling equipment

IN THE FIELD of clay brick and structural tile, production last year ran about 2% above that of 1950 (as of the third quarter of 1951). Production this year is expected to be about the same, with no change anticipated.

New construction applications for brick are being employed, such as use in new insulated cavity walls. New accessories are coming into use, too, such as mortars, scaffolds, water proofers, etc.

All brick manufacturing equipment (major units) are large, made-on-order units only. Northern California, without exception, is buying new equipment for plant expansion and for maintenance at the same (or faster) rate than during 1949 or 1950.

Barium carbonate, a clay admixture, is becoming more difficult to procure. Otherwise, no changes are expected in the sources of raw materials.

During 1952 the trend toward use of materials handling equipment will continue, and increase. Machinery is now being developed to make brick

manufacturing a 100% untouched-by-hand operation, for the first time anywhere. This is an Eastern development, and may not be ready for two more years.

Cement and Structural Clay Products

1947 Production—In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Mountain	Pacific	Calif.
	\$	\$	\$
Hydraulic cement.....	12.2	64.8	50.7
Brick and hollow tile.....	4.5	7.7	4.9
Colorado .....\$1.8			
Floor and wall tile, except quarry tile.....		8.3	8.3
Sewer pipe.....	1.0	6.2	
Clay refractories.....	1.3	4.4	
Structural clay products, n.e.c.	0.7	5.2	4.2
Washington .....\$0.6			
Oregon 0.4			

CEMENT—

Greatly increased production meets demands of military and high-priority private construction

CEMENT, typical of a basic Western industry, is another business that is hard put to satisfy demands of increasing consumers. Last year the military was probably the main customer, with high-priority private con-

struction ranking close behind.

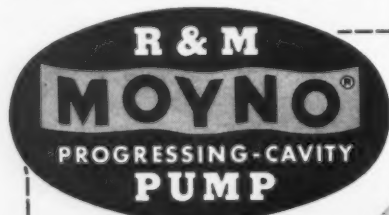
This year the supply-demand situation will no doubt be alleviated to a considerable extent, since our cement-producing firms have expanded both their production and storage facilities.

For example, Permanente Cement, now ranking as one of the world's three largest, expanded from a 2,500,000-bbl. plant (it was built in 1940) to a current production capacity of 7,000,000 bbls. annually. Last year saw completion of one of the largest (over \$6,000,000) and most complete expansion programs ever undertaken by that firm.

Calaveras Cement, during 1951, established new all-time records for production and sales. They are now in the midst of their second post-war expansion program, and indicate that by the middle of this year, their cement-producing capacity will be 300% of their capacity five years ago.

From the looks of real estate, military, and industrial development in the West and particularly in California, it may come to pass late this year that the total production will equal or exceed consumption.

Washington reports continued increase in precast concrete products, and generally good conditions in the industry for the state.



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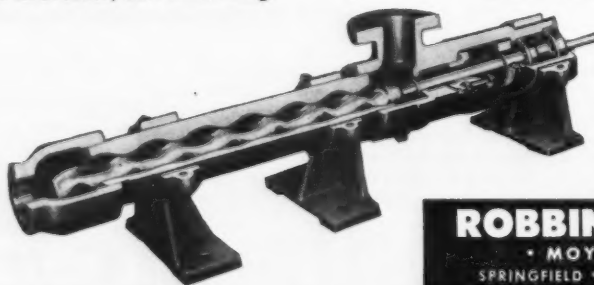


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PLASTICS—

This year will probably see the upswing in a growing industry that will make Western history

PLASTICS is another comparative adolescent in the Western industrial family, complete with growing pains and face blemishes. But, unlike some of its brothers, it is growing faster than we realize.

Although last year's production was slightly below that of the previous year (1950 was a record-breaker), next year's anticipated output may be on the start of a healthy climb.

Plastics manufacturing about shut down production at the end of October because of excess inventories. During the last two months, however, plastics goods have been consumed at a very good rate, and business should be good again after the turn of the year.

Nature of the plastics business is such that material costs represent two-thirds of the manufacturing cost. Obviously, the quickest way to reduce prices is to cut out material and make things flimsier and less useful. That is what some of the manufacturers did, and the entire industry suffers. Now, however, that trend has probably ended, and next year will see the beginning of real product development in plastic manufacturing.

There has been and still is a great deal of change going on in injection machines. It is a good guess that practically all of the equipment now in use will be obsolete or obsolescent within the next five years. Such things as uniform temperature control and a much greater plasticizing capacity are now fully developed and will undoubtedly be standard on all new equipment.

As far as raw materials are concerned, Monsanto Chemical Co., Dow Chemical Co., Bakelite division of Union Carbide and Carbon Co., duPont, and others, are constantly improving both the quality and beauty of color plastic molding materials. This trend, so important to Mrs. Consumer, will no doubt continue at its present rapid pace for years to come.

Consumption Figures

Seven Western states now consume polystyrene in plastic fabrication at the rate of about 22,000,000 to 24,000,000 pounds annually. Next year's estimate puts that figure at closer to 28,000,000 pounds, judging by the current rate of consumption.

Polyvinyl chloride is consumed, ac-

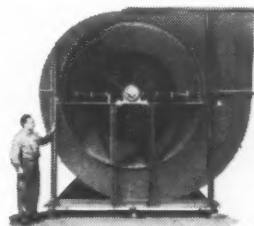
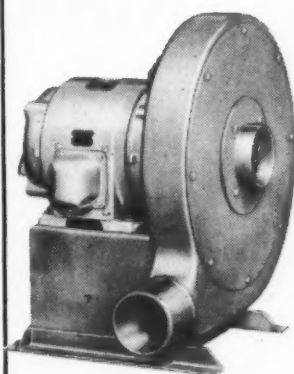
ording to some sources, at the rate of 12,000,000 pounds annually in the West. However, only about 8,000,000 of that can be traced by us to Western sources of manufacture, which would

indicate that the balance is shipped West from manufacturers in other parts of the country. This might also indicate, at the rate of use, that chemical manufacturing firms may be casting an eye toward Western locations for such a manufacturing plant.

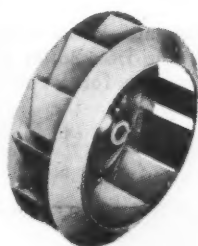
Vinyl film can compete with cellophane, now, which means that it will have a terrific impact on the packaging field. No calender for vinyl is available West of Chicago, but there is probably enough market to justify one.

Style is what counts in the film field. Heavier film is sold under the seller's

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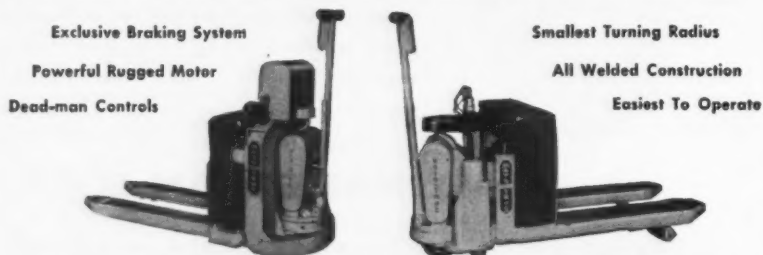
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One user of 8 Moto-Truc Walkies, reduced the man hours unloading a boxcar from 16 to 4. Viz:—One man with a Moto-Truc Pallet now does in 4 hours what formerly took 2 men 8 hours with former methods.



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brand name. Sheeting used for upholstery, luggage, etc., is becoming more and more of an item in manufacture. Koch Luggage of San Rafael, Calif., and Shwayder Bros. of Denver, for example, are quite successful in producing luggage from this material. There should be an outlet for at least 1,000,000 feet of it per year, if calendered out here.

Lots of dispersion resins are used on the West Coast. Market for vinyl wire insulation is nearly saturated in this area. Over 25% of clothesline now manufactured is plastic. Venetian blind ladders are going big on the West Coast. They are made out here, extruded from plastisol and reinforced with glass fibers.

About 4% of the total vinyl production is used for injection molding in the West.

Until a more heat-resistant plastic can be developed, that material is discouraging to use for cans. Heat turns the cans white, and destroys their "appetite value" for the housewife. Otherwise, plastic for use in can fabrication presents a tremendous market potential.

Good Metal Substitute

Plastics made from plentiful raw material are being increasingly used in the manufacture of aircraft, in order to conserve stocks of strategic metals.

Boeing Airplane Co., for example, is using plastics strong enough to substitute for aluminum alloys, as standard production material for many parts on the company's swept-wing B-47 Stratojet bomber. An additional advantage also accrues: the plastic forming process requires a relatively small outlay of tooling, one of the most critical items in short supply.

AiResearch, a division of the Garrett Corporation, now applies plastic tooling to an important production activity. Plaster cores for impeller blade assemblies are formed in plastic molds. These new molds have yielded an increase of over 1,300% in parts produced per tool, as compared with formerly used molds of dental stone.

Principal plastic in use by Boeing today is Fiberglas combined with polyester resin. AiResearch is using Tool-Plastic, a thermosetting liquid phenolic resin supplied by Rezolin, Inc., Los Angeles.

Photographic Equipment

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Calif.
Motion picture equipment, except film	4.5	....
Still picture equipment, except film	4.9
Other photographic equipment and supplies	0.9	0.9

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ELECTRONICS—

Western electronics production is ready for a major increase, and it is now on the way

A NUMBER OF TRENDS can now be easily identified in the electronics industry. Primary among them is the increasing number of manufacturers who are seeking to locate in the West, and take advantage of the research and engineering skills available here.

Where the West may have been credited with perhaps 20-25% of the nation's research and development in this industry, yet only about 2% of the production, that ratio is rapidly changing. Research and development is stepping up, but nowhere nearly so fast as the production of components in the West.

Taking 1951 as a measure, national production in the electronics industry during 1952 could be nearly twice that of last year. And during 1953, estimates have it that (barring any unforeseen difficulties) production figures may nearly double those of 1952.

Miniaturization

Miniaturization (decreasing the physical size of units) is another trend easily identified. This was reported in these columns last year, but since then the pace has been stepped up even more.

Primary request for miniaturization stems from the military, for airborne and submarine electronic equipment. Today's high speed military aircraft and submarines are far different from those used during World War II. They carry much more electronic equipment in the same or smaller space.

Most of this equipment, as made a few years ago, was both bulky and heavy. Miniaturization reduces both these factors.

At this point, another trend crops up. It is called "Ruggedization" (and this is another military term). As equipment gets smaller, it introduces more problems, such as increased performance demand on components. This could have a profound effect on reliability and efficiency. Hence, the government now insists that their equipment be miniature only insofar as it is reliable and rugged. Research activities, particularly at Stanford Research Institute where the program is being carried on under government sponsorship and direction, are straining in the attempt to meet the optimum point on both. Industry, too,

is highly interested in this phase, since it could mean less expensive equipment.

Another Western development: a tape recorder for video transcription. This unit was developed by Jack Mullin, the man originally responsible for commercially available high-fidelity tape recording as we know it today, in all radio stations and sound studios.

One item which should be mentioned here is the transistor. While it was originally brought to public attention by Bell Labs in New York, it is going to have a profound impact on the electronics industry in the West as well as elsewhere. Other electronics firms, Western as well as Eastern, were working on these little units concurrently with Bell Labs.

Transistors are of significance to the electronic industrial scene because they are that little item which bids fair to supplant half of the vacuum tubes now in wide common use. Transistors have the ability to amplify, rectify, and oscillate in receiving functions, just the same as vacuum tubes, but transistors are considerably smaller in physical size than even subminiature vacuum tubes (such as are now used in hearing aids).

One transistor that one of our editors saw in an electronics research lab (it was referred to as a "monster" by the engineer who introduced it to him) was about as large in diameter as a grain of wheat. It was encased in a transparent composition bead so that the entire unit was about the same size as this figure "0."

Believe It or Not

Hard to believe, but that is the midget that is going to replace many vacuum tubes in the months to come. It may be as much as two years from now before transistors are commercially available, but they are coming in commercial quantities.

Suffice it to say that electronic equipment will be built, after the commercial appearance of transistors, considerably smaller and more reliable (transistors will not expire, as do ordinary vacuum tubes). Further, operating efficiency of transistors is far higher than that of a vacuum tube.

Printed Electronic Circuits (commonly referred to as PEC) have established their foothold in the industry, as

evidenced by the fact that one firm in the Middle West has long passed the million mark in their production.

They are being used as parts of circuits in commercially available radio and television sets, right now. The day may not be far off when the entire circuit of such apparatus is made up of PEC units. A trend of the industry seems to be manifesting itself in that direction, and growing stronger every day.

With miniaturization and high production schedules demanded by both military and commercial consumers, another most definite trend in the electronics industry is toward mechanization, particularly in the production of these small items needed in tremendous quantities.

Television

Biggest news in the television industry in 1951 was completion of the nation-spanning microwave system, and inauguration of it at about the time the Japanese Peace Treaty Conference was in session at San Francisco.

People in New York or Washington could see the conference, in their own television sets at home, just as clearly as though they were present in person at the sessions.

Earlier in the year, a microwave system was completed between San Francisco and Los Angeles, linking those two areas in the same manner.

Still another, completely different system, was developed by W. A. Palmer Films, Inc., in San Francisco. It is a new technique in television production using "electronic movies." The procedure enables a TV show to be pre-recorded and edited in a manner similar to the technique Palmer Films introduced to radio on the Bing Crosby show four years ago.

This system involves full use of the flexibility of electronic TV cameras in a "closed circuit," and records the images on photographic film by a special improved Kinescope recording camera, developed by Palmer.

High quality images are comparable to "live" and microwave telecasts, and are free from the usual Kinescope recording "shutter bar" effect which mars so many video recordings.

SOAP—

NEW plants, Lever in Los Angeles, P & G in Sacramento, were big events of 1951. Detergent demand outruns production, but because detergents are slightly off-white in chemical form, industry is endeavoring to remove the color "imperfection," also adding soaping chemicals to provide the familiar suds.

MOTOR VEHICLES—

Sharp drop in automobile assembly in line with curtailment in manufacturing at Eastern plants

AUTOMOBILE ASSEMBLY on the Pacific Coast in 1951 dropped considerably below the 1950 output, in line with curtailment of production in the manufacturing plants in the East.

Estimated total Western assembly of cars and trucks, as calculated on Dec. 1 last was 558,991 cars and trucks, plus the December estimated output for Chrysler Corporation, which was not available at the time of going to press because December schedules for this company had not been set. In 1950 the Coast assembly plants produced 733,252 cars and trucks.

Estimates submitted by the various automobile manufacturers are as follows:

Company	Make	Cars	Trucks
Chrysler.....	Plymouth	49,249	
(11 months actual production. No. estimate for Dec.)	Dodge	26,181	
	Chrysler	10,764	
Ford.....	Mercury	30,345	13,119
	Lincoln	1,739	
	Ford	92,246	
	Ford		25,706
General Motors.....	All	213,711	
	All		46,562
Kaiser Frazer.....	Kaiser	2,384	
Nash.....	Nash	11,750	
Studebaker.....	Studebaker	28,200	
Willys-Overland.....	Sta. Wagons.....	2,660	
	Jeeps	1,845	
	Sed. Del.	360	
		2,170	
TOTAL		471,434	87,557
Grand Total, Cars and Trucks.....			558,991

Motor Vehicles and Equipment

Value of Shipments—in Millions of Dollars
Source: 1947 Census of Manufactures

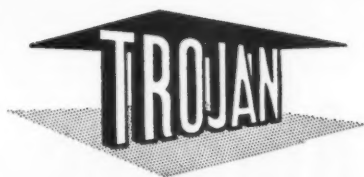
	Pacific	Wash.	Ore.	Calif.
Passenger cars.....	579.2	....	....	....
Other vehicles on chassis of own manufacture	230.6	....	....	76.4
Truck and bus bodies*	15.2	3.0	0.7	11.5
Truck trailers†	21.8	2.4	3.7	15.7
Automobile trailers, for attachment to passenger cars	37.3	....	....	25.9

* For the Mountain States \$2.0 reported in this classification, of which \$0.1 was from Idaho.

† \$1.4 reported for the Mountain States.

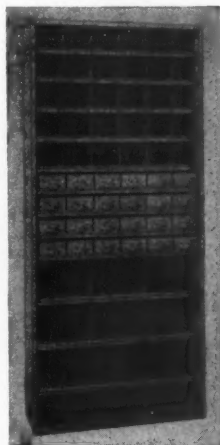
APPAREL—

WESTERN apparel and shoe makers on short-week basis most of 1951, due to slow demand. Market Weeks could almost not have been held.

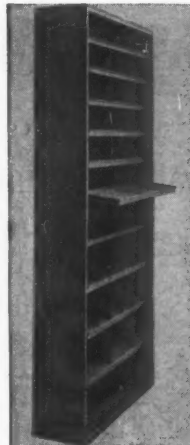


SPECIFY TROJAN

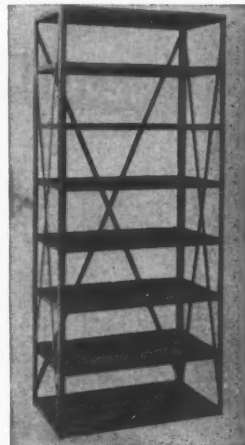
FOR INDUSTRIAL EQUIPMENT



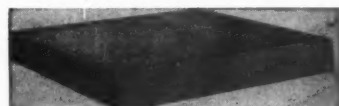
TROJAN shelving, 12" deep, 36" wide, 84" high. Showing use of drawers and dividers.



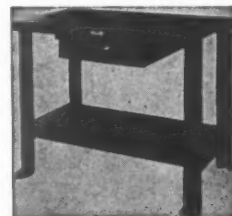
TROJAN slide-in shelving. Showing slide-in shelf adjustment for rapid change and set up.



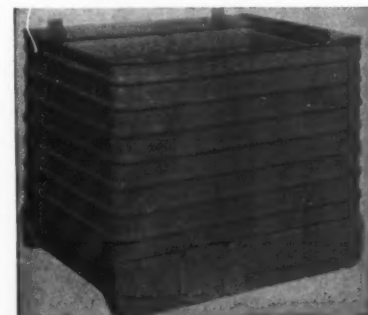
This type of shelving for bulky storage. Available in 12, 18, 24-inch depth. 36" wide and 84" high.



TROJAN steel pallet available with smooth or corrugated deck. The answer to your heavy pallet loads.



TROJAN steel work bench. Available in all standard lengths and widths. With or without drawers or shelves.



TROJAN corrugated tub skids. For storage and transporting your bulky or heavy loads.

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Tank Trucks
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RUBBER—

Industry has hopes for new silicone rubbers. Synthetics pierce natural rubber price bubble

HIGH-FLYING JETS have made things tough for the rubber people. Such products as bomb bay doors and de-icers, which formerly faced temperatures no lower than -40° , now hit stratospheric temperatures of -70° and possibly as low as 100 below zero.

Ducts and flexible connectors in propellor-driven planes could formerly get by up to 300° temperatures, but the jet jobs commonly develop 500° heat and threaten to reach 600° . Progress is being made, however, with most of the industry's expectations being based on the new silicone rubbers.

The natural rubber price bubble was deflated in 1951 after it had zoomed from around 17 cents a pound to nearly a dollar. The government reopened its synthetic plants and price of the natural crude coasted downhill to about half that figure.

Restrictions to conserve latex have brought a strong shift in synthetics for nearly all rubber products, and government stockpiling has contributed to this trend. The public's scramble to hoard tires in 1950 proved premature, although the amount of latex going into passenger car tires has been greatly curtailed.

The foam rubber industry did not turn out to be a complete casualty, after all, and Goodyear in fact opened up a new foam plant at Los Angeles. So far, no serious manpower shortages have yet developed.

Rubber Products

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Wash.	Calif.
Tires and inner tubes.....	*156.5	....	142.5
Camelback and tire repair materials	* 8.7	....	6.9
Mechanical rubber goods *	56.5	0.3	17.0
Other rubber products, n.e.c.	* 7.1	....	6.9

* The Mountain division is included with the Pacific division.

Pottery and Related Products

1947 Production—In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Wash.	Calif.
	\$	\$	\$
Fine earthenware (white-wear) table and kitchen articles	9.4	....	9.4
Art, decorative, and novelty pottery ware	*5.5	....	....
All other pottery products, n.e.c.	*3.4	0.1	2.2

* Mountain Division is included with Pacific Division.

DAIRY PRODUCTS—

**People increase faster than cows,
production still lags behind—
new machines are helping**

DEMAND IN THE WEST for fluid milk, cream, and manufactured dairy products is still greater than the area's productive capacity, even in face of an increased cow population and increased productive capacity.

In California alone, for example, during 1949, around 70,000,000 lbs. each of butter and cheese had to be supplied from out-of-state sources to satisfy demand. Other states fared somewhat better, but with the exception of Idaho all other Western states needed more of these products than they produced.

Efforts are constantly being pursued to rectify this situation, through research and development, and installation of new productive activities. But as fast as they produce results, Western population growth seems to take up any slack and again present the problem of deficient supply.

Productionwise, this year's volume was not up to previous records, and it is estimated that 1952 will be even below 1951.

New Items

Vitamin D homogenized milk in paper bottles, and Yogurt, were the fair-haired new promotion items this year, but without any major effect as yet on the industry. Liquid sugar is being used to a limited extent. New production trends seem to point to use of more farm milk holding tanks and more permanent sanitary pipe installations. To overcome any possible labor shortages, mechanization is the most probable solution.

Production developments: continuous butter-making machines; new plastic wrappers to inhibit mold and increase sales of "rindless" type cheese; better quality control, close grading of products.

Utilization of Commercial Milk Production in the Western Region

1940 and 1947-1949

Source: Estimates based on U. S. Department of Agriculture reports.

Utilization	Billion Pounds of Milk Equivalent			
	1940	1947	1948	1949
Fluid milk and cream	5.0	6.8	7.0	7.2
Butter	5.1	3.1	2.4	2.6
Cheese	0.7	0.9	.8	.8
Condensed and evaporated milk	1.0	1.3	1.3	1.2
Whole milk powder	0.01	9.2	.1	.1
Ice cream	0.6	1.2	1.0	1.0

Ice Cream Production

(In Thousands of Gallons)

1949 Figures Actual Production; 1950 Estimated

Source: Dept. of Statistics and Accounting, International Assn. of Ice Cream Manufacturers, Washington, D. C.

	1949	1950
Colorado	5,275	5,205
Other Mountain States	10,735	11,855
Total Mountain	16,010	17,060
Washington	7,390	7,350
Oregon	6,303	6,680
California	37,546	48,505
Total Pacific	51,239	52,715
Total, Eleven Western States	67,249	69,775

FLOUR—

MODERATE expansions in milling and grain storage capacity were made by Western flour mills in 1951. Ten months' output was 26,236,000 sacks, and the year's total possibly a little above 1950.

	Calif.	Oregon	Wash.
Number of Mills	11	13	19
1950 Output, in cwt.	4,607,000	4,631,000	9,118,000
Capacity (24-hr. day), cwt.	20,098	26,625	47,054
% of Capacity based on 5-day week	90.2	68.5	76.3



Hope springs eternally... Pogo springs have given way to piston rings in moving personable young ladies from one place to another. But western industry—that's everyone from Phoenix to Pogo Pogo—still looks to California for the best springs for any purpose.

Catalog available upon request.



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ATOMIC ENERGY—

AEC begins construction of various atomic energy facilities in the West during 1951. More to come?

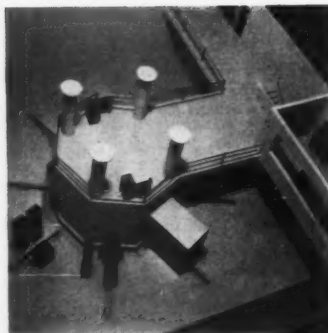
A BRIEF thumbnail sketch of new atomic energy facilities under construction during 1951 in the West follows:

Early in January, the Commission announced that it was going to use part of the 5,000 sq. mi. Las Vegas Nevada Bombing and Gunnery Range (a U. S. Air Force reservation) for experiments necessary to the atomic weapons development program. This was to be in addition to the Eniwetok Proving Ground in the Marshall Islands.

Test activities at Las Vegas were to include experimental nuclear detonation for the development of atomic bombs, carried out under controlled conditions.

On March 30, the Commission announced that it would build a specialized research laboratory on a section of the National Bureau of Standards grounds south of Boulder, Colorado. On completion, this unit would be staffed by personnel from the National Bureau of Standards.

On the following day, March 31, the Commission announced that a new classified research project was being undertaken in the San Francisco Bay area. That project involved construction of a particle accelerator which is



MODEL of new low-power atomic reactor at North American Aviation's plant in Southern California.

used to pursue a classified research program for the AEC. Approximately \$7,000,000 was involved in cost of construction.

This program was undertaken by the California Research and Development Co. (a subsidiary of California Research Corp., owned by Standard Oil of Calif.) in cooperation with the Radiation Laboratory of University of California.

Location is at Livermore, Calif., a U. S. Naval Air Station. The Navy Department cooperated, and agreed to work with the Commission in obtaining a transfer of the property.

During the latter part of 1951, a number of atomic bombs of various types were tested in Nevada. No comment from the AEC on progress in the field, as yet.

PAINT—

California, and the West, are growing faster than paint can be produced to cover up things

CALIFORNIA is growing faster than we can produce paint to cover it. Western paint production is ever falling short of its consumption because of population growth.

Major paint producing areas of this nation lie in three spots: largely in the Middlewest, some in Texas, and the rest in California. Yet during 1947 (the last year for which we have com-

plete figures) California produced close to 10% of the nation's paint.

And during the 12-year period 1935-1947, while the value added by manufacture increased 210% for the nation, it zoomed 370% for California.

Generally speaking, raw materials for paint production cost more in California than in other parts of the nation. However, as Westbound freight rates on the finished product tend to offset premium Western manufacturing charges, the Western producer can draw a fairly well-defined market, relatively free of Eastern and Southern competition.

Paints, Varnishes, Pigments, and Allied Products

Value of Shipments—In Millions of Dollars
Source: 1947 Census of Manufactures

	Mountain	Colorado	Pacific	Washington	Oregon	California
Oil and water paints and stains.....	3.4	2.7	68.4	3.2	3.1	62.1
Varnishes, lacquers, enamels, japans, thinners, and dopes.....	1.8	1.3	51.7	0.9	3.0	47.8
Other primary products of the paints and varnishes industry.....	....	....	*3.8	....	....	3.7
Inorganic color pigments.....	....	....	*13.5	....	....	11.4
Whiting and fillers.....	0.2	....	2.9	0.1	0.1	2.7

* Mountain division is included with the Pacific division.

INSTRUMENTS—

Survey gives an enumeration of machinery in Los Angeles area used for instrument manufacture

A 1951 survey of business in the Greater Los Angeles area dealing in the manufacture of instruments brought forth the following information:

Thirty-three plants reported a total of 2,515 employees. Floor area of these plants is 441,380 square feet. Machinery listed included:

- 150 lathes (engine, tool room, turret, precision)
- 92 milling machines
- 178 drills
- 31 grinders

plus a large number of assorted miscellaneous tools such as jig borers, hand and automatic screw machines, punch presses, injection molding machines, electronic testing and measuring apparatus, etc.

Instruments and Related Products

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Calif.
Aircraft flight instruments and automatic pilots.....	1.2	1.2
Other laboratory, scientific and engineering instruments.....	3.3	....
Aircraft and nautical instruments.....	1.8	....
Industrial process instruments.....	11.2	....
Mechanical measuring and controlling instruments, not reported by kind.....	0.5	0.5
Optical instruments and lenses.....	1.1	1.1
Ophthalmic goods.....	0.1	....
Surgical and medical instruments.....	....	1.7
Personal safety devices.....	....	1.5

Surgical and orthopedic appliances and supplies reported as follows: Mountain, 0.2; Colorado, 0.1; Pacific, 2.6; California, 2.2; Oregon, 0.3; Washington, 0.1.

Dental instruments, equipment and supplies reported as follows: Colorado, 0.4; California, 1.9; Oregon, 0.1.

Communication Equipment and Related Products

1947 Shipments: In Millions of Dollars
(Source: U. S. Census of Manufactures)

	Pacific	Calif.
Household radio receivers, television sets, radio phonographs, phonographs, and record players.....	....	13.7
Commercial radio communications, radio navigation aids, and broadcast equipment.....	3.3	3.3
Electronic type components for communications and industrial electronic controls.....	*4.6	....
Radios and related products, not specified by type.....	3.5	3.4
Phonograph records.....	*16.4	....
Communication equipment, n.e.c.	0.5	0.5

* Mountain Division is included with Pacific Division.

FURNITURE—

Heavy spring and late fall selling helps back production — Eastern factories extending West

PRODUCTION in the furniture manufacturing industry in southern California in 1951 kept pace and exceeded the 1950 volume by around 5%, resulting probably from heavy spring and late fall selling.

Last year was not a record one; it was exceeded by the banner years 1947 and 1948. This coming year's volume has been predicted to exceed last year's by \$100,000,000 at wholesale nationally by Professor Philip Neff, of U.C.-LA.

Styling and design keynote the news value of furniture manufacturing currently, though nothing unusual is being produced in the kinds of furniture. A trend is identified toward low-slung, informal type furnishings, inspired by the "Pacifica" promotion by Jackson's of Oakland. Typical California designs are continuing to reach for broader national distribution.

Another trend is the decision of Eastern factories to open Western branches, as for example the Douglas Furniture Corp. at El Segundo.

Use of Japanese hardwoods may become evident in the industry soon. One of the fairly interesting developments in manufacture of wood furniture is the continued and increasing use of dimension lumber purchased from Southern mills and processed and assembled in southern California. Increased freight rates on finished furniture will also have a tendency to localize manufacturing centers.

HELICOPTERS—

A lot of growing pains but not much production — Most effort devoted to experimentation

THIS BUSINESS is really a youngster, but it is full of enthusiasm and growing pains. In the West alone, there is quite a bit of interest, but (at this writing) not so much production, compared on a national basis.

Hiller Helicopters, in Palo Alto, Calif., is the major producer in the West, but there are many others who are either in a ready-to-produce status or still in experimental work.

Those include: American Helicopters, in Manhattan Beach, probably the next largest in order of govern-

ment contracts at the moment. American is now building a plant in Arizona, to produce a government order.

McCulloch Motors, in Los Angeles, has an experimental tandem rotor ship, a government order for more like it, and further plans on the drawing boards.

Rotor Craft, in Glendale, is busy on experimental activity. See *Western Industry*, November 1951, page 44, for a discussion of the "Pinwheel," their rocket-powered one-man military unit.

Hughes Aircraft, in Culver City, is presumably still busy working on the monster helicopter publicized earlier in the press. That giant has blades 65 ft. long, and it is supposed to be able to lift 100,000 pounds.

Total Western production orders right now amount to somewhere around \$25,000,000 or better (our estimate).

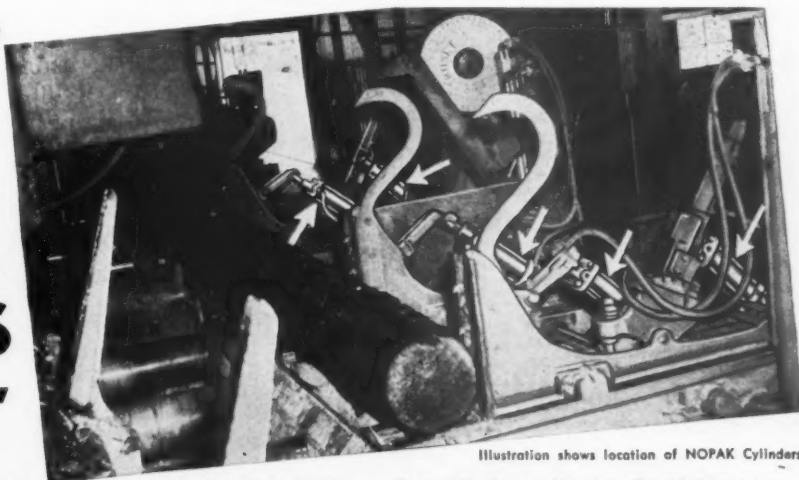
LIQUID PETROLEUM GAS—

INCREASED trend toward carburetion for motor trucks and stand-by industrial plants reported in the West, and metering of sales instead of tank units. More gas-air plants coming for gas companies, using propane.

"Air Dogs" Powered by NOPAK CYLINDERS in "UNION" Log Carriage...

For Technical Data on NOPAK Valves and Cylinders, refer to Sweet's File for Product Designers, or write for Bulletin SW-1.

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Specially built by Union Iron Works is this 6 ft. Band Headrig and Log Carriage, equipped with electric networks and feedworks, installed at the Smith-Nielsen Mill, Spalding, Idaho. All of the "Air Dogs", however, are actuated by NOPAK Model "E" Air Cylinders, with Pendulum Mounting for oscillating movement.

This is one of many similar applications of NOPAK Cylinders and Valves, in heavy-duty lumber mill equipment. It may suggest how you can use air power effectively in vital machine movements . . . in your plant, or in equipment you build for your customers.

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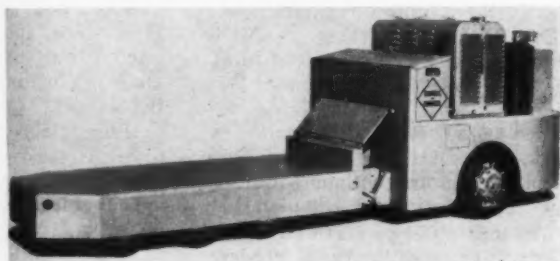
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Use postage-paid card following page 98 to obtain further information on products described on these pages and literature listed on following pages . . .

Skid Load

E-101

Features claimed: This electric-powered low lift platform truck, Model L-14, is designed for transport of loads weighing up to 40,000 lb., and is one of the largest of its type available. It will transport skids and skid boxes in plants



where large heavy loads such as stampings, forgings, and castings, as well as dies and heavy machinery, must be moved quickly and efficiently. Truck derives its self-loading feature from the fact that load platform, when positioned beneath load, can be raised hydraulically to lift load off floor for transport. It is not designed for tiering or stacking operations, its principal function being that of horizontal transportation. Overall length of truck is 193 in., width, 56 in. Platform measures 96 in. long by 41 in. wide by 17½ in. high in lowered position.

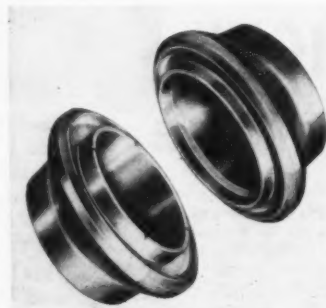
Available from: Elwell-Parker Electric Co.

T & G Coupling

E-102

Features claimed: This scale-free welding coupling which eliminates damaging welding scales from piping systems, consists of two forged halves. Ends of hubs are prepared

for welding to pipe or welding fittings of corresponding sizes. When two halves of coupling are brought together, tongue of one slips into groove of other. A circumferential cavity directly beneath beveled welding area prevents burn-through or formation of icicles in the interior. Cavity also insulates interior



from extreme welding heat and prevents scaling. This tongue and groove arrangement makes piping easy to align. Hubs of couplings are relatively short, and any scale or protrusions formed by two attachment welds can be conveniently reached and removed before coupling is connected. There is no scale to damage valves, traps, pumps,

WESTERN INDUSTRY—January, 1952

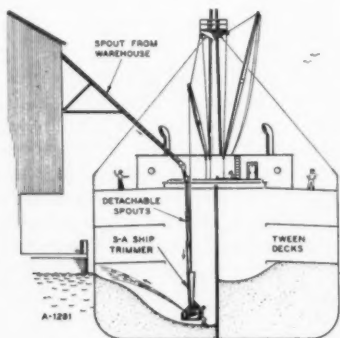
instruments and other equipment built to close tolerances; complete penetration is obtained without danger of burn-through or formation of icicles. This coupling is useful in connecting piping designed to carry hydraulic fluids, high pressure steam, compressed air, certain chemicals and gases, lubricating oil, fuel oil, carbonated beverages and various food products. It is available in sizes from 1¼ through 12 in., and in carbon steel, stainless steel, aluminum and other metals and alloys.

Available from: Tube Turns, Inc.

Keeping Trim

E-103

Features claimed: Operating principle of this trimmer is simple. Idler discs on outer edges of a high speed belt keep it running in a concave path. Thus material chuted to belt



is hugged closely to it by centrifugal force and quickly attains belt speed of 2,700 fpm. For most materials this speed carries it well over 50 ft. from trimmer. A gear mechanism enables operator to tilt stream of material from belt through a vertical arc. Variable belt widths and lengths are available for specific capacity re-

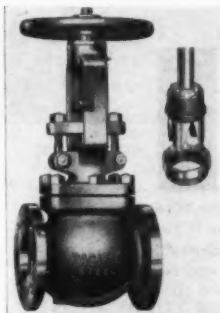
quirements. Capacities range up to 1,500 tons per hour, and it is available in either fixed type for permanent mounting on a vertical chute at dockside, or in deck type, which can be cable-suspended from ship's rigging. Fixed type has a mechanism which swivels thrower belt in a horizontal arc from a control panel outside hold. The deck type, suspended by cable, must be steadied by two men in the hold and can easily be spun through a 360-deg. horizontal arc. Hand-operated gear mechanism controls vertical angle of throw.

Available from: Stephens-Adamson Manufacturing Co.

Buttons and Flows

E-104

Features claimed: Of interest to those engaged in selecting valves for throttling service are these "V" port globe valves with special disc designed to regulate flow through four "V" shaped ports. They are cast carbon steel regularly furnished with 12% chromium stainless steel trim. An indicator is provided to adjust flow accurately and tell position of disc at a glance. Available with flanged ends or butt-welding ends in the following sizes: 150 and 300 lb. series, 1½, 2, 3, 4 and 6 in.



Available from: Pacific Valves, Inc.

Pulling Your Freight

E-105

Features claimed: Features of this "Dok-master" warehouse and railroad freight two-wheel hand truck include a completely enclosed steel box side shaft; unbreakable formed steel wheel brackets; a heavy duty scientifically designed axle assembly with end bolts completely enclosed.

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Pacific Telephone

Rivets, bolts and other outward projections have been concealed or eliminated, and all exposed surfaces have been steam-smoothed to prevent tearing and snagging of bags, sacks and cartons.

Available from: Dico Company.

What Goes Up

E-106

Features claimed: This Barrett portable elevator is powered by an Ingersoll-Rand air motor hoist, operating as a compressor. It is designed for greater safety, especially in

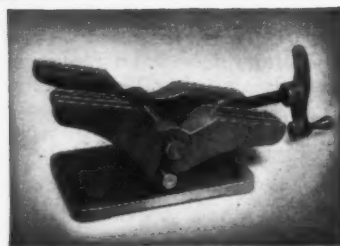


hazardous locations. Air motor hoist is economical in consumption of compressed air. Required pressure is 80 lb., and air consumption is approximately 2.5 cu. ft. per min. per ft. of lift. Recommended hose size is 3/4-in. Other features include an automatic brake which positively holds the load, an automatic up-stop which automatically shuts off the air, stopping motor just before platform reaches top position; a safety down-stop which automatically shuts off air and stops motor at platform low

level; a graduated reversing valve which gives complete control of platform in any position, and a poppet throttle valve that positively prevents air leakage when hoist is idle. Radial airplane type motor permits unusual compactness for operating mechanism. Cylinders are renewable and

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Edward L. Parsons, 600 Sixteenth St., Oakland, Calif., Phone TWinoaks 3-1577;
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WESTERN INDUSTRY — January, 1952

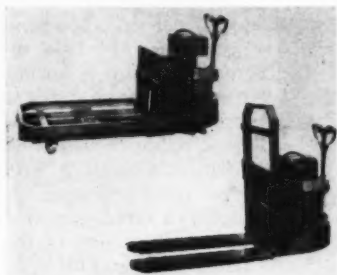
interchangeable. Air hoist has a large oil chamber, from which all moving parts are automatically lubricated.

Available from: Barrett-Cravens Co.

E-107

Planned for Platforms

Features claimed: A new platform adapter for Towmotor electric pallet trucks converts Towmotor Model "W" into a platform truck, and makes possible efficient handling of platforms, skids and tote boxes. Constructed of sturdy steel framework, adapter adds extra height to forks of this model. When not in use, it folds up over battery and latches securely. Open frame construction permits full visibility for operator. Height of forks



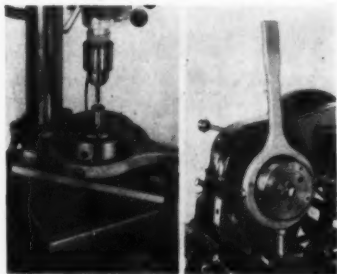
with adapter is 7 in. in lowered position, 11 in. raised. This permits plenty of clearance in transporting tote boxes, skids and platforms. Adapter is also available in lengths to match standard pallet truck forks up to 72 in. long. Special platform adapters for use with batteries longer than 27 in. can be ordered.

Available from: Towmotor Corp.

Chuck A Block

E-108

Features claimed: This speed chuck's three jaws close universally, yet each is capable of individual adjustment over its full capacity range. This not only permits exact zeroing adjustments but accommodates eccentric chucking and accurate centering of square stock, with only three jaws. Jaws are closed by a sliding sleeve which is drilled and tapped for three equally spaced adjusting screws. Each screw end contacts top surface of one jaw, which is tapered from front to back. As sleeve slides forward, each jaw is forced inward an amount equal to taper, or approximately 1/64 in. total. Jaws are individually zeroed or set for eccentric work by raising or lowering adjusting screw. Only three sets of jaws are required to cover full capacity range from 1/8 to 1 in. A second model covers from 1/8 to 1 5/16 in. with four sets of jaws. All jaws are of tool steel with hardened and ground surfaces.



face of one jaw, which is tapered from front to back. As sleeve slides forward, each jaw is forced inward an amount equal to taper, or approximately 1/64 in. total. Jaws are individually zeroed or set for eccentric work by raising or lowering adjusting screw. Only three sets of jaws are required to cover full capacity range from 1/8 to 1 in. A second model covers from 1/8 to 1 5/16 in. with four sets of jaws. All jaws are of tool steel with hardened and ground surfaces.

Available from: Wallace Pawley Enterprises.

Light and Airy

E-109

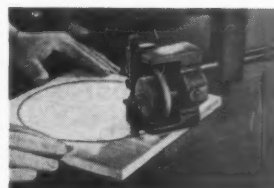
Features claimed: Outstanding features of this series of portable air drills include a one-piece housing which provides a compact, well balanced, exceptionally short and light weight drill. A powerful five-vane air motor, to provide a constantly smooth flow of power, a built-in automatic lubricator, a throttle valve which eliminates air leakage, a muffler which minimizes exhaust noise, an adjustable exhaust deflector which permits operator to direct exhaust air in any direction; and a palm-fitting handle for operator

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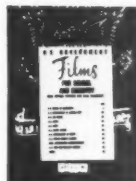
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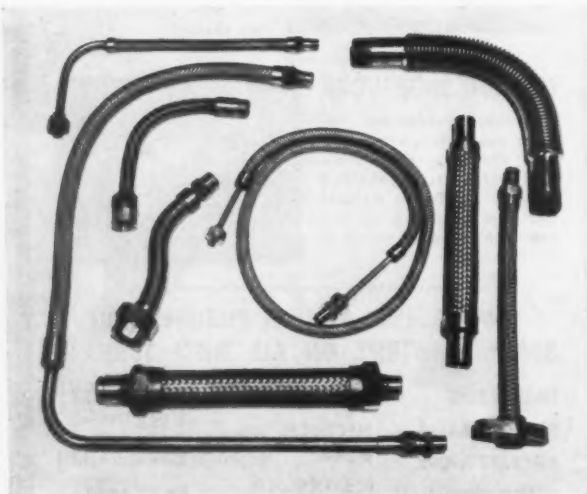
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comfort, are all important features. Drill has solid-type rotor, special alloy steel cylinders and precision type heavy duty ball bearings. Available in different speeds for work up to 1/4 in. capacity.

Available from: Ingersoll-Rand Co.

Strong Holes

E-110

Features claimed: Holes are punched and reinforced in one operation with this Target punch-reinforcer. It is simple to operate. Just insert paper, press lever and, instantaneously, holes are punched and permanently reinforced from rolls of strong adhesive back tape. If no reinforcement is desired, just press a little lever and machine can be used as a simple punch. A three-hole version of this reinforcer is now being developed. Machine is so designed that new tape can be inserted quickly and easily.

Available from: Stationers Supply Corp.

High Belting Point

E-111

Features claimed: Bed section of this Universal power belt stacker and conveyor is constructed of 12-gauge high tensile steel. It is available in 12, 14 and 16-ft. lengths, and is furnished in 12, 16 and 18-in. belt widths. Heavy duty "ruff-top" conveyor belting is used. Speed of belt is about

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- ☐ What's the best rinse temperature after cleaning? after deoxidizing? See page 12.
- ☐ Do you have efficient controls for the concentration and temperature of your cleaning and deoxidizing solutions? See page 14.

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WESTERN INDUSTRY — January, 1952

60 fpm. Drive unit is totally enclosed within bed of conveyor. Feeder sections, 24 in. long, can be either power driven belt or gravity roller type. Discharge section is a 24-in. gravity roller section. Castered, portable carriage has floor locks to prevent creeping while conveyor is in use.



Conveyor is mounted on "V" type supports which are quickly adjusted for any desirable height or angle of operation by fast-acting Acme screws, actuated by conveniently located hand wheels. Conveyor is equipped with side rails which are adjustable to various widths of packages.

Available from: Keville Industrial Service.

E-112

This One Conveys for Gourmets

Features claimed: "Supertex" is an odorless, tasteless, non-toxic conveyor belt especially designed for food industries. It is washable, oil proof and water proof, as well as resistant to acids, alkalies and heat. Multiple plies of light weight woven duck give greater strength combined with

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pipe threading with this
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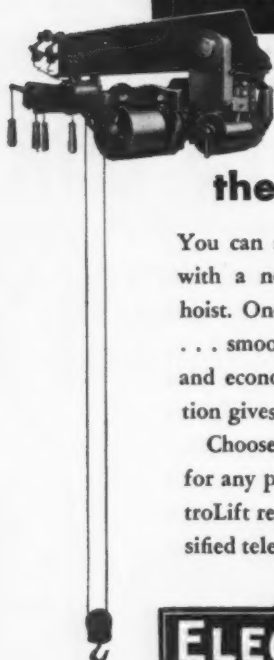
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simple device that
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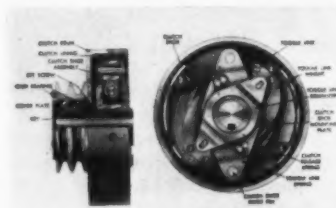
many times less stretch than ordinary heavier weight loosely woven fabrics. Perfectly smooth top cover is guaranteed to leave no impression regardless of material conveyed. This is because Supertex is calendered and press-cured exactly as heavier conveyor belts. It is made with full width of fabric; it is not folded, and has no splices. Its flexibility enables it to run perfectly over small pulleys. A vulcanized multiple step lap is used which will last as long as belt itself.

Available from: Baldwin Belting, Inc.

A Clutch Treat

E-113

Features claimed: Tog-o-loc clutches are designed for operation on any 7- to 15-hp. engine with 1 1/8, 1-7/16 or 1 1/2-in. standard shaft. They have a normal engagement speed, i.e., 11 to 1,200 rpm., but disengage at 800 rpm.



Wide differential in engagement and disengagement speeds is made possible by a linkage connecting heel and toe of the two opposing shoes. This toggle lock is centrifugally actuated and equalized on both pick-up and release of load.

Both clutch drum and pulley assembly ride free on dual ball bearings during idling periods. All models have hub bores mating with standard engine shafts, without necessity for any extension, grinding, boring or slotting. They are available in two types—with standard size pulleys with

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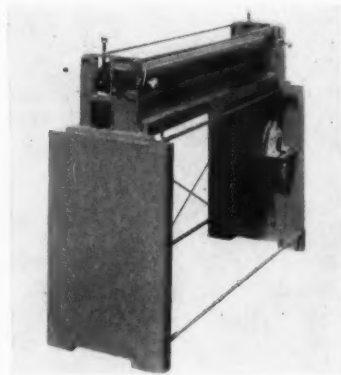
single and double grooves or with plain hubs onto which special service pulleys may be mounted.

Available from: Salsbury Corporation.

Coat Department

E-114

Features claimed: This roller coating machine applies paint, lacquer, oil and adhesives. Model 51 is driven by a 1/4-hp. motor and operates at a speed of about 64 fpm. to



coat one or both sides of flat work up to 52 in. wide. Type C-1 applies a coating roll above the pressure roll in same vertical plane and includes a small doctor roll on infeed side. Type D-2 has two spreading rolls, one above the other, and two doctor rolls, each on the infeed sides, for two-side coating. This item is particularly adaptable to aircraft

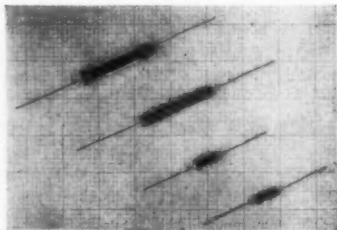
manufacturing. It is useful in metal trades for applying drawing oil, and in rug and fabric plants for sizing and coating.

Available from: L. R. Wallace & Co.

E-115

Keeping Up Your Resistance

We can't resist telling you about the error we made in this column last month when we said that "Carb-ohn" deposited carbon resistors were available from *Western Electric Co., Inc.* Although they are manufactured under a



license arrangement with Western Electric, they are available from the *Phaestron Co.*, 151 Pasadena Ave., So Pasadena, Calif. These resistors are particularly useful for high frequency applications where high values of resistance

are essential or power dissipations up to two watts are required. They also answer the need for closely matched

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Clean-Out U-Type Manometer (Model B-1169 WM)

Semi-steel clean-out head is removable from body frame for filling and cleaning U-tube. For line pressures up to 100 lbs. per sq. in. Large bore "pyrex" tubing 1/8" inside diameter gives flat indicating fluid meniscus. Bold 1/2" high scale numerals provide for distant reading. Ask for catalog sheet B-1169 WM.

Well Type Manometer (Table Mounting)

For portable service in the field, production testing, or in the laboratory. Glass tubing is gland packed at each end block and is supported at spaced intervals to prevent tube distortion. Also available for wall mounting, pipe mounting, and flush front panel mounting. Ask for catalog sheet A-203 TM.

Well Type Manometer (Front-of-Board Mounting)

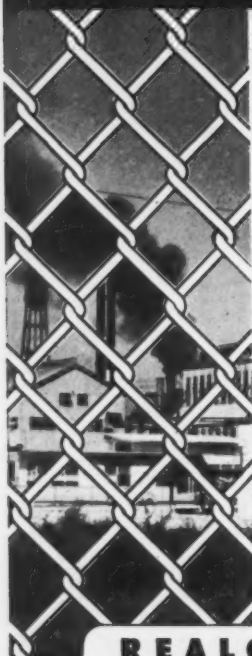
The instrument body channel, scale, and indicating tube mount to the front of the panel; instrument well mounts behind panel. Connections are made behind the mounting panel. Provides an accurate, quick, and direct method of measurement. Ask for catalog sheet A-324 FB.

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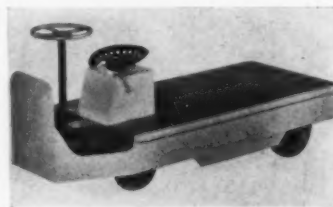
units for computer networks and other applications, and are of particular advantage for electronic equipment which is subject to extremes of temperature. They can be employed as replacements for wire wound types in many applications. They are available hermetically sealed in glass or clad in specially developed humidity impervious casings, which provide stability over time and freedom from variations due to climatic changes. Available in a variety of mountings. Wattage ratings range from 1/3 to two watts with a resistance range of 20 ohms to 200 megohms.

Available from: Phaestron Company.

"Pony Express"

E-116

Features claimed: This new model "Pony Express" electric platform truck is easier to operate, is safer and has improved maneuverability. Other features include finger-tip lever control for selection of direction travel, automatic acceleration for four speeds — forward and reverse, easier steering by means of sprocket control, a "deadman" breaker switch mounted under driver's seat which cuts off all power when seat is unoccupied. Overall width, 36 or 40 in.; platform loading area, 23 sq. ft.; loading capacity 2,000 lb.; pneumatic tires.



Available from: Rocky Mountain Steel Products, Inc.

E-117

You Can Take It With You

Features claimed: This heavy-duty portable oil hydraulic power unit is easily towed and can be used anywhere electric power is available. It is especially suited to testing aviation and automotive equipment and powering machine tools and processing machinery. It is built with fixed volume pumps in sizes ranging up to 60 gpm. at 2,000 psi.; hand wheel and pressure compensated controls enable users to meet specific job needs up to 5,000 psi. and 75 hp. Multiple valve combinations and simple hand control of two pressure lines permit pump to take suction from built-in 100-gallon tank or from an outside source, thus enabling users to set up a wide variety of testing patterns. It has micronic filter, built-in relief valve, flowmeter, pressure gauges, and electric controls, all mounted in a heavy, welded steel frame.

Available from: The Rucker Co.

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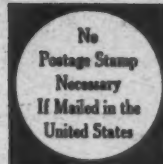
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119-L K.O. for Industrial Dermatitis

with a radically new idea in skin protection for industry. Learn about it in a booklet prepared by *Vanfair Products*, 3757 Wilshire Blvd., Los Angeles 5, Calif. Brochure gives complete details on this company's new protective skin lotion. Order your copy by the above key number.

120-L You'll Be Truckin' On Down

... when you read about *Elwell Parker Electric Co.'s* industrial truck motors in a new bulletin available from *Ira G. Perin Co.*, 575 Howard St., San Francisco. Get latest info on motor armature, insulation, brushes, bearings and shaft by ordering this by key number.

121-L If Being Well-Put-Together

is your aim, why not check out *Russell, Burdall and Ward Bolt and Nut Co.'s* handy compilation of important fastener data which puts this information at your finger-



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122-L This Rhyme Won't Cost a Dime

If Longfellow is your meat and diesel engines your business, *General Motors Corp.'s* publication, "What Do GM Diesels Do?" is tailor-made for you. This instructive booklet on diesel engines, written in rhyme and illustrated with sketches, is available to you without cost. Request by above key number.

123-L Don't Be a Grump About a Pump

You won't have to be if you get a copy of *Gray Co., Inc.'s* (141 Eleventh St., San Fran-

cisco) bulletin on Graco powerflow pumps. Here's real help for your pumping problems. Request it by above key number.

124-L In Your Search For Clear, Clear Water

why not order a copy of an 8-page brochure entitled "Research in Air and Water Pollution," published by *Research Division, College of Engineering, New York University*?

125-L Should You Be Spurred On?

"Challenger" spur gear hoist may solve your problem. A leaflet describing this piece of equipment is available from *Coffing Hoist Co.*, Danville, Ill. Request it by above key number.

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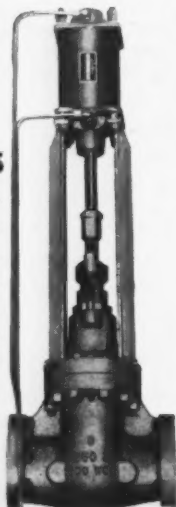
Write for Bulletin 510.



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126-L You'll Want This One

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127-L We All Have Our Ups and Downs

but *Geo. D. Roper Corp.*, Rockford, Ill., illustrates how these can be painless in a new brochure describing its elevator pumps. Through a request by above key number you can receive complete specifications on this piece of equipment.

128-L Why Gripe About a Pipe

when you can obtain a copy of *J. A. Zurn Mfg. Co.'s* new pipe line strainer data manual, available by above key number.

129-L Flemish Flavored

Belgium Electric Sales Corp., 7 Front St., San Francisco, will be glad to send you a series of six folders on its line of electric motors. Request this important import by above key number.

130-L If It's Metal Detecting You're Neglecting

send for *Eriez Manufacturing Co.'s* new catalog on its RCA metal detector, and learn how this instrument can indicate the presence of metallic particles of microscopic size, either magnetic or non-magnetic, in open or packaged non-magnetic materials. Available by above key number.

Filter Facts 131-L

Our reader service will make available to you *Schleicher & Schuell Co.'s* catalog on analytical filter papers, which contains valuable information on chemical analyses and biological procedures.

132-L If You Have an Axe to Grind

or anything else to grind, for that matter, *Gardner Machine Co.'s* new grinding catalog is just what the doctor ordered. This 32-page piece of literature, available through our reader service, gives job applications for flat surface disc grinding.

133-L Clark Makes Its Mark

with the most recent issue of "Materials Handling News" which discusses the basic subject of time and place utility. Let *Clark Equipment Co.* solve your materials handling problems for you: send for your copy today through our reader service.

134-L You'll Like These Wall Flowers

Utica Drop Forge & Tool Corp. offers two wall charts through our reader service. One explains how to use pliers and the other shows how quality tools are forged and electronically hardened. Request by above key number.

135-L This Is a Real Steel

Armco Steel Corp. offers our readers a revised edition of its fabricating manual, "Machining of Armco Stainless Steels." Why not send for this complete listing of grades and analyses and individual descriptions of grade characteristics?

136-L You'll Be the Victor

if you send for the four-color apparatus catalog offered through our reader service by *Victor Equipment Co.*, 844 Folsom St., San Francisco. Complete information on Victor's entire line is yours for the asking.

137-L If You're a Cut-Up

why not send for *E. F. Houghton & Co.'s* 32-page book entitled, "Getting Down to Cases on Metal Cutting"? This contains actual performance records with accurate facts and figures, and shows the advances made possible with modern cutting methods.

138-L A Brake for You

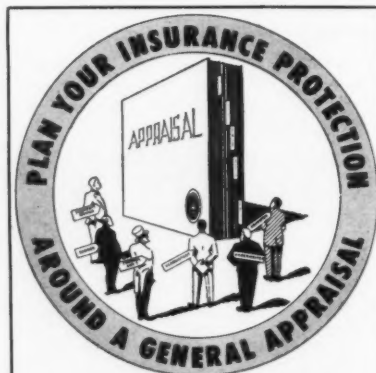
is *Columbia Machinery and Engineering Corp.'s* new bulletin on power press brakes. Order by above key number.

139-L Patterson's Pointers for Mill Men

Why not take advantage of the opportunity offered by *Patterson Foundry & Machine Co.*, East Liverpool, Ohio, and send for its catalog on ball, tube and rod mills which is offered through our reader service?

140-L Go West Young Industry

The reasons for this sound advice are detailed in a book now obtainable from the *San Francisco Bay Area Council*, describing the geographic and economic advantages of the San Francisco Bay Area as a Western headquarters for American industry. Order a copy by above key number.



Never before was there such a definite need for accurate property valuations as there is today. Replacement costs are much higher than original costs or book value. That's why it is essential when buying insurance to plan your fire insurance protection around a General Appraisal.



141-L
This Is Good Stuff

Be sure to get a copy of *Cooper-Bessemer Corp.'s* booklet on Type-M line motor-driven compressors. Order through our reader service.

142-L
About Electric Trucks

Yale & Towne Manufacturing Co. describes its complete line of electric trucks in a 12-page booklet which promises to deliver the goods. Just order by above key number.

143-L
"What Makes It Tick?"

or "The Inside Story of Towmotor" has just been published by *Towmotor Corp.*,

Cleveland, Ohio, for the purpose of providing basic information on its line of fork lift trucks. Order a copy by the above key number.

144-L
Why Not Buy Oil and Burn Gas

is the question posed by *Vapofier Corp.*, 205 West Wacker Dr., Chicago, in a folder on its oil-gas generator. Order your copy by above key number.

145-L
Keeping a Cool Head

will be no problem for you when you get a copy of *Townsend Co.'s* new 12-page illustrated pamphlet which describes cold-headed parts for military applications. Order by above key number.

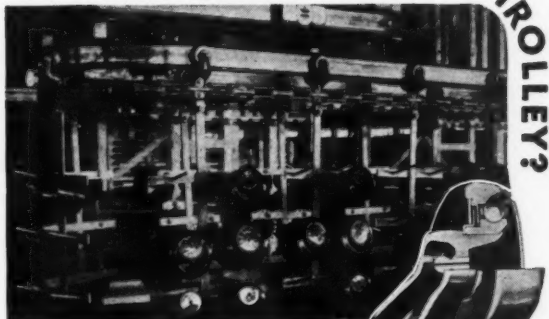
147-L
The House That Builds Jacks

offers our readers a new bulletin which includes specifications and application data on hydraulic jacks. *Templeton, Kenly and Co.*, 1020 S. Central Avenue, Chicago, will send you a free copy if you order by above key number.

146-L
You'll Be Right in the Center of Things

when you read *Ready Tool Co.'s* catalog on its line of anti-friction centers, carbide-tipped centers, high-speed centers, tool holders, grinding and milling dogs and accessories. Request a copy through our reader service.

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THE WEST ON ITS WAY

ALASKA

PLYWOOD PREDICTION BY AUTUMN

—Construction will begin soon on Alaska Plywood Corp.'s plywood plant in Juneau, which is expected to be in production by next August. Building and equipment costs will exceed \$1,000,000. Plant, 200 x 400 ft., will require 50,000 feet of logs daily providing employment for about 25 men in the woods and 200 in the plant. The company is presently considering putting up a box factory adjacent to the plywood plant.

ARIZONA

FIRE-STOPPERS FOR GLOBE—Raybestos Corp. is planning to establish a warehouse in Globe for purchasing asbestos fiber in small or large amounts.

TRIO—Grand Central Aircraft Co., Tucson, adds another operation—repair and maintenance of Air Force B-29's—to its current remodification program of B-29's and refinement of B-47 stratojets. The B-47 project requires an addition of 1,500,000 ft. of floor space, a 2½-mi.



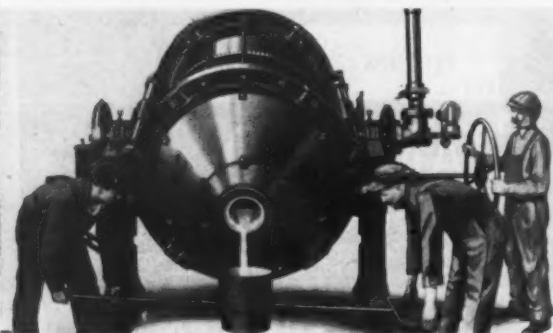
A 30% INCREASE in plant area is the result of new construction by Sierra Drawn Steel Corp. at its Los Angeles location. Increased facilities will permit Sierra to give improved service, including complete metallurgical and engineering service, production flexibility, and faster delivery. Company comprises only independently owned cold finishing bar mill in the West.

runway to handle the largest of aircraft, and doubling current employment of 4,000 persons. Number of planes and number of employees affected by the latest operation was not disclosed.

MINING COMES HIGH—Magma Copper Co. is negotiating with Reconstruc-

tion Finance Corp. for an approximate \$80,000,000 loan to be used to finish development of the San Manuel copper orebody, 46 miles northeast of Tucson. Expenditures by Magma on the ore deposit have already reached \$10,000,000. A yearly yield of 70,000 tons of refined copper is expected from the project,

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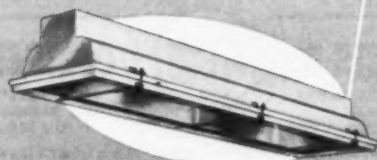
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- 3 Constellation Slimline fluorescent
- 4 Educator incandescent
- 5 RLM Standard Dome Reflector
- 6 The Master floodlight
- 7 LH Ceiling light



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which would equal 8% of the present national domestic output.

CALIFORNIA

ROASTED PYRITES—A new Herreschoff pyrites roaster is now in operation at Stauffer Chemical Co.'s Richmond sulfuric acid plant to utilize pyrites as a substitute for a portion of the sulfur consumed in manufacturing the acid. Crude sulfur will continue to be in short supply for at least another two years, and addition of these new facilities which utilize pyrites (in plentiful supply) will assure Western sulfuric acid consumers of a more dependable source of supply.

IN THE BAG—Food Machinery and Chemical Corp. has purchased Simplex Packaging Machinery, Inc., Oakland manufacturer of bag-making and packaging machinery. Newly acquired company will be operated as an integral part of the parent corporation's Stokes and Smith Co., an FMC subsidiary at Philadelphia, Pa.

GEOPHYSICAL PLANT—United Geophysical Co. has built a new, modern \$750,000 plant in Pasadena. Each of the company's five divisions, research and development, engineering and supply, operations, interpretation and computation, and finance, is housed in separate buildings.

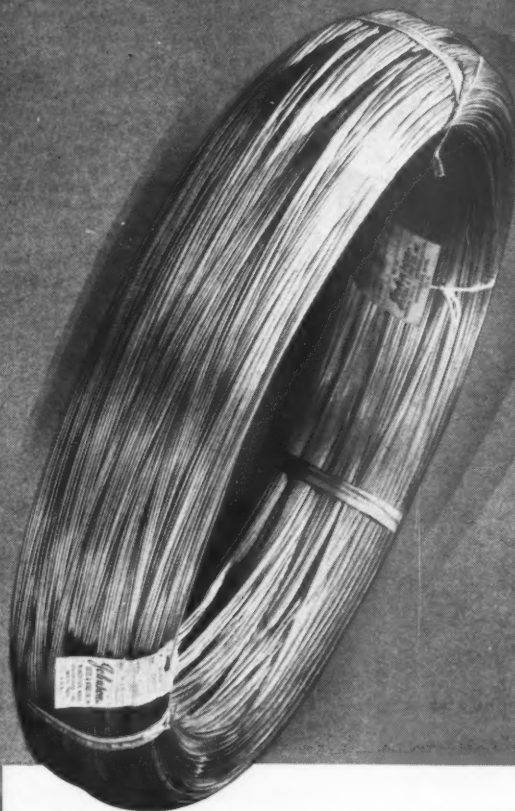
FLYING DESTROYER—U. S. Air Force awards Northrop Aircraft, Inc., a production order for quantity output of a new aerial destroyer designated as F-89D. New plane is latest version of the proved Northrop Scorpion. First model is completed and is now undergoing tests. F-89D is a rocket-equipped interceptor-fighter nearly as large as World War II medium bombers.

ALL FOR OIL—Standard Oil Co. of California has completed plans for construction of a new 16,665-ton tankship for its Pacific Coast fleet. New ship is similar in hull form to the wartime "T-2" type. It will be built by Sun Shipbuilding and Dry Dock Co., Chester, Pa., starting in June 1952, with delivery scheduled for midsummer of 1953. Ship will have a cargo capacity of 140,150 barrels and estimated cost is \$5,250,000.

FROM FREEMAN TO BONDWELL—Bondwell, Inc., is new name of former C. E. Freeman Co., manufacturer of various types of coatings, such as flame spray, plastic paints, coatings for zinc, nickel alloy, vitreous enamel and conveyor belt rolls. New address is 1401 Middle Harbor Road, Oakland.

TOWERING—General Petroleum Corp. has launched an improvement project at its Torrance refinery costing over \$500,000. A key part of the new facilities is a giant distillation tower, 10 ft. in diameter and 157 ft. high, built during World War II, but never used. Design adaptations have made the tower acceptable for use at the Torrance plant. J. B. Gill Co. was awarded contract for erection of the new facilities.

GAS CRACKERS BUILD NEW LAB—Filtrol Corp. has contracted MacIsaac, Menke & Roach, Inc., Los Angeles, to build a new research laboratory adjacent to Filtrol's Vernon manufacturing facility.



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ties. The 16,000 sq. ft. building will be constructed of precast reinforced concrete panels with poured columns and roof beams and will house the most advanced facilities for research on petroleum cracking catalysts, absorbents and related products manufactured by Filtrrol.

PACIFIC VALVE FORGES AHEAD—Pacific Valves, Inc., manufacturer of steel valves, obtains plant of Pacific Forge, Inc., 1562 North Spring St., Los Angeles. Pacific Forge will operate as a subsidiary employing about 50 persons at present with future plans for expansion.

U. S. AGREES WITH GLIDDEN—United States Government and Glidden Co. have entered into an agreement to share the cost of exploratory diamond drilling on Glidden's zinc properties in Shaasta County. If the exploratory drilling confirms the estimated 225,000 tons of zinc present, mining operations will begin at the earliest practicable date.

ARCO COMPANIES PURCHASED—American-Marietta Co. has purchased Arco Co. and Arco Co. of California, Ltd., and will operate these firms as subsidiaries.

STRAWS IN THE WIND DEPT.—Rohr Aircraft Corp. is reported to be considering several sites outside the San Diego area to erect a new plant.

AEROL SOLD—A group of Southern California businessmen have purchased Aerol Co., materials handling equipment subsidiary of Lockheed Aircraft Corp. New owners are planning to expand and develop additional aluminum products. Present employment is 60.

CRANE CO. ACQUIRES HYDRO-AIRE—Crane Co., of Chicago, Ill., through a newly organized California subsidiary, has acquired assets formerly owned by Hydro-Aire, Inc., Burbank producer of aircraft valves, filters, actuators and other high-precision hydraulic, pneumatic and electric accessories.

Discussing Crane Company's recent purchase of Hydro-Aire, Inc., are, l. to r., H. H. Rhoads, president of Hydro-Aire; C. S. Gross, vice president and general manager of Lockheed Aircraft, and J. L. Holloway, president of Crane Co.

(For more details, see item above)

ROLL OUT THE BARRELS—Bechtel Corp. receives a \$1,500,000 contract from Standard Oil Co. of Calif. for expansion of alkane plant facilities at Standard's Richmond refinery. This expansion will increase plant's capacity to 3,000 barrels a day.

COLORADO

\$6 MILLION IN BISCUITS—Bowman Biscuit Co., Denver, is planning to erect a \$6,000,000 plant in Chaffee Park Heights area of Denver.

PUEBLO POWER PLANNED—One of the largest transformers ever installed in Colorado will be put to use by Southern Colorado Power Co. to handle electric power between Pueblo and Colorado Springs. Transformer weighs nearly 131,300 lbs. and holds 12,000 gallons of oil. It can handle electric loads up to 15,000 kilowatts. A 110,000-volt interconnecting transmission line between the two cities will be constructed soon to be used in conjunction with new transformer.

BUGS, LOOK OUT—Chemical Corp. of Colorado is changing former Creager Manufacturing Co. plant in Denver into a modern plant for manufacturing agricultural and household insecticides. New facilities will double production and employ 75 workers 24 hours a day. A modern bio-assay chemical laboratory, a greenhouse for testing insecticides on vegetable and grain test plots, and a practical control for livestock insecticides through use of test cattle herd raised on plant grounds are facilities included in regrooming of the plant.

NEVADA

HERCULEAN INSECTICIDES—Hercules Powder Co. has made plans to construct another plant for manufacturing



toxaphene, a chemical base for agricultural insecticide. Plant will be located at Henderson and will cost more than \$2,500,000. From 60 to 70 people will be required when the plant starts operations early in 1953.

QUADRUPLE OFFER—Four industrial firms have received tentative approval from the Colorado River Commission for Nevada on an offer for purchase of state-owned Basic Magnesium plant near Hoover Dam for approximately \$24,000,000. Stauffer Chemical Co., Titanium Metals Corp. of America, Combined Metals Reduction Co. and Western Electro-Chemical Co. are firms making this offer, which includes plant site, adjacent Henderson townsite and residual facilities. An \$18,000,000 balance is still owed to the government by the State of Nevada on the property.

OREGON

CANNERIES CAN'T CAN—Van Camp Sea Food Co. has closed down its Astoria and Warrenton tuna canneries, as well as its cannery in San Diego, Calif. Heavy importation of cheaply produced Japanese and Peruvian tuna was blamed for these shutdowns.

LUMBER CHANGES HANDS — Pilot Rock Lumber Co., Pilot Rock, has purchased Brown & Hoxie Lumber Co., Ukiah, Calif. Plant will be liquidated and entire Ukiah operation will be incorporated into Pilot Rock concern. Deal involved mill, mill site, 1,200 acres of timber rights, and 3,800 acres of timber lands.

A BIT PART — Coast Range Timber Products Co. has sold an interest in its Salem facilities to George E. Miller Lumber Co., Portland. Plant has a dry kiln capacity of 80,000 ft., and a complete remanufacturing mill, covering seven acres. Miller has mills at Sweet Home, Newport and Oswego and is constructing a new mill at Toledo.


SALTY — A newly organized firm, American Metallic Chemicals Co., has leased three acres and numerable buildings at the former Oregon Shipyards to produce metallic salts.

SUTHERLIN INCORPORATES—Sutherland Plywood Corp. has incorporated for \$300,000 and expects to be in operation soon. New firm will use property of the former Rock Island Logging Co. and employ a crew of 25.

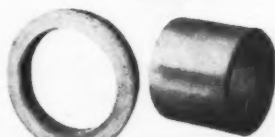
UTAH

MINERALLY SPEAKING—Mineral Development Corp., Salt Lake City subsidiary of Godfrey L. Cabot, Inc., Boston, Mass., buys up Somerset and Oliver coal mines of Utah Fuel Division, Kaiser Steel Corp. Mines are located at Somerset, Colo., and produce 1,750 tons of coal a day to be used in the production of coke. Its use may also be applied in the phosphate industry of Idaho, Wyoming and Utah.

SMELTERING—U. S. Smelting, Refining & Mining Co. acquires properties of Bingham-Congor Copper Co. and United Bingham Copper Co. at Bingham for \$800,000. Bingham-Congor has 130




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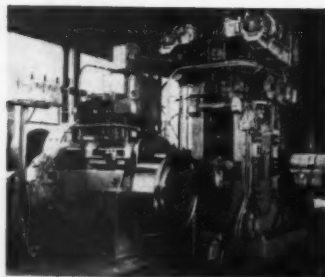
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acres of patented mining claims and United Bingham holds 265 acres of claims, all in the Bingham district. When stock transfers and exchanges are completed, both Bingham concerns will be dissolved.

WASHINGTON

SHINGLES AGAIN—M. R. Smith Lumber & Shingle Co., Seattle, has reopened its five big shingle mills at Tacoma, Moclips, Aloha, Mineral and Beaven.

NEW HANGAR FOR BOEING—Boeing Airplane Co. is considering purchasing 16 acres of King County land to erect a \$4,000,000 hangar at Boeing Field, for use in testing Boeing's B-52 eight-jet heavy bomber now in production. Hangar would be 280 x 785 ft., one of the largest in use by this company.

POWER PERMIT—A 50-year license to City of Tacoma is granted by Federal Power Commission to construct and operate two dams, totaling \$135,000,000, on Cowlitz River. One, near Mossyrock, will have three 75,000-kw. power units with provision for a fourth. The other, near Mayfield, will have three 40,000-kw. power units and facilities for another when needed. An additional \$7,000,000 may have to be spent to reconstruct any fish resources that are destroyed by installation of the dams.

ICE IS CREAMED NO MORE—Swift & Co. closes its Seattle ice cream plant and offers property for sale. A strike shut down the plant four months ago and company officials rendered it economically unsound to reopen the plant or rebuild business lost while the strike was going on.

PAPER EXPANSION—A \$5,000,000 expansion program is slated for West Tacoma Newsprint Co.'s plant near Steilacoom. Program calls for addition of a second paper making machine to increase present output of 26,000 tons a year to 62,000 tons a year. The plant is owned by 14 daily newspapers in Washington, Oregon and California, with an additional 30 expected to participate with increased production.

FERTILIZER COMES TO SPOKANE—Construction has started on Activated Fertilizer Corp.'s \$100,000 plant in Spokane. Costs are divided equally between the building itself, and equipment and machinery. Plant, with 4,225 sq. ft. of floor space, will manufacture a fine superphosphate soil fertilizer.

UNITING—Everett Pulp & Paper Co., Everett, has been purchased by Simpson Logging Co., Seattle. No active management, name, policy or location changes will be made.

WYOMING

FMC BUILDS TRONA PLANT—A new \$1,400,000 trona plant, now under construction, will go into full operation early in 1953. Intermountain Chemical Co., subsidiary of Food Machinery and Chemical Corp., will operate this Westvaco plant and trona mine. Employment is estimated between 325 and 400. Approximately 340,000 tons of soda ash will be produced annually at the plant.

WESTERNERS AT WORK

Arizona

W. W. LITTLE becomes mine superintendent at the *Copper Queen Branch, Phelps Dodge Corp.*, Bisbee. Little was formerly general superintendent of the company's *United Verde Branch* at Jerome. H. D. CLARK, former mining engineer at Bisbee, takes over as mine superintendent of *United Verde Branch*.

California

A. H. MATHIEU named assistant general manager, Western Division, *Kraft Foods Co.*

Super-Cold Corp. names G. G. MICHEL plant manager of its mechanical division. Michel was formerly manager of manufacturing planning at *Lockheed Aircraft Corp.*

JOHN HILSTROM takes over as manager, Northwest division, *California Packing Corp.*, succeeding A. W. EAMES, JR., who becomes assistant manager, canned foods production, San Francisco.



McClellan

JOSEPH H. LANCOR, JR., assumes position as director of the *Transducer Division* of *Consolidated Engineering Corp.*, Pasadena.

HARRY LOWELL, GEORGE HUBERT and OWEN STEBBINS are added as field men in the trade promotion department for *California Redwood Association*. CARNEY CAMPION joins the public relations department.



Cannon

ROBERT D. HANDLEY resigns as advertising manager of *Sylvania Division, American Viscose Corp.*, and assistant advertising manager of *American Viscose Corp.* to become administrative assistant to president of *Western Package Products Co.*, Pacific Coast converter of transparent materials.

J. R. WILLSON succeeds D. C. STADLER as personnel manager for *Northrop Aircraft, Inc.* Stadler named assistant director of industrial relations. S. C. MCKENZIE, former industrial relations night representative,

named night manager of industrial relations; E. J. BAUM selected as staff assistant in industrial relations and is succeeded by J. P. BENJAMIN, formerly in customer relations division, as selective service coordinator; MAL MOUNTAIN, former industrial relations staff assistant, becomes assistant manager of personnel activities and services; JAMES W. TUTHILL appointed manager of labor relations; and ROGER G. MCGUIRE, former assistant director of industrial rela-

tions and labor relations manager, appointed manager of industrial relations at the company's Anaheim division.

W. R. GREENSTREET, superintendent of the Stockton plant, succeeds A. V. WHITFIELD as superintendent of *Santa Fe Railway's* Bakersfield ice plant. GUY VANCELEVE, superintendent of icing at La Junta, Colo., succeeds Greenstreet, and FRED WILLIS, general foreman of the San Bernardino, Calif.,



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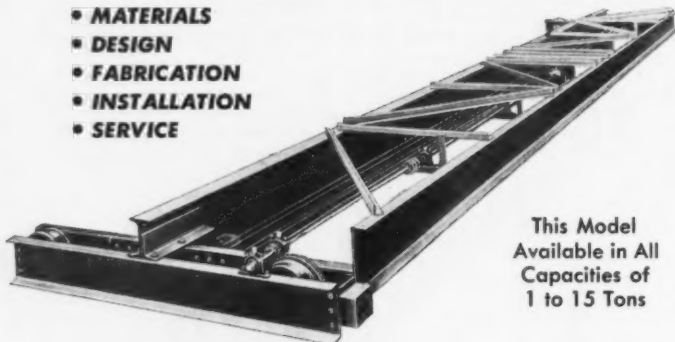
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ice and pre-cooling plant, replaces Vancleve at La Junta.

G. R. MONKHOUSE elected vice president, Western Division, *Shell Chemical Corp.* He was formerly general manager of the Western Division.

LT. COLONEL JOE E. CHILDERS, *United States Army Transportation Corps*, is assigned to *Pacific Intermountain Express Company's* offices in Oakland to work with P-I-E for twelve months in studying the company's transport operations.

DONALD L. PENZOTTI becomes personnel manager of *Soult Steel Co.'s* San Francisco plant. JAMES D. WILKINSON named manager of commercial research division.

WLADIMIR P. LEWICKI selected works manager of *Southwest Steel Rolling Mills*, Los Angeles.

L. E. DAVIS, former Sacramento plant manager, *American Can Co.*, replaces G. A. KAMENA as plant manager of *Canco's*



Kamena

Davis

Pacific factory in San Francisco. Kamena is appointed to Davis's position as Sacramento plant manager. DR. B. S. CLARK appointed scientific director of research and technical department.

Helipot Corp. makes the following staff changes at its plant in South Pasadena: W. M. SEMPLE, former works manager for *Astatic Corp.*, Ohio, becomes works manager; C. E. MANN, formerly with *Raytheon Mfg. Corp.*, Waltham, Mass., becomes chief production engineer; F. H. CAMPBELL, former staff assistant for *Helipot*, promoted to sales; and W. L. DENISON, assistant chief design engineer, promoted to chief and department head.

WILLIAM J. McELROY elected president of the West Coast companies of *Round Associate Chain Co.* The firms in this group



Luchs

McElroy

are *Seattle Chain & Mfg. Co.*, Seattle and Portland, *Round California Chain Co.*, South San Francisco, and *Round Los Angeles Chain Co.*, Los Angeles. McElroy will continue as general manager of *Seattle Chain*. ARTHUR H. LUCHS, general manager, elected vice president of *Round California Chain Co.* Luchs has been general manager since 1930 and will continue in this capacity.

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WALTER DREYER succeeds I. C. STEELE, retired, as vice president and chief engineer of *Pacific Gas and Electric Co.* K. C. CHRISTENSEN succeeds E. J. BECKETT, retired, as treasurer.

FRANK HOLT, treasurer, succeeds S. H. BERCH, deceased, as president of *Arden Farms Co.* J. A. TONGUE, vice president, elected treasurer.

TERRELL C. DRINKWATER, president of *Western Air Lines*, elected president for 1952 of *Los Angeles Chamber of Commerce*.

GEORGE I. LONG elected vice president and general manager of *Ampex Electric Corp.*, Redwood City.



Long

Ordway

E. R. ORDWAY named general manager of *Kaiser-Frazer Corp.* aircraft production on West Coast. Ordway will be in charge of operations of the Oakland Aircraft Division and Richmond Machining Division.

JAMES R. NASON, JR., resigns as general manager of *International-Karpen Division*, *International Furniture Co.*, Huntington Park.

WM. A. WOLFF appointed works manager of *Simplex Packaging Machinery, Inc.*, Oakland, a newly acquired subsidiary of *Food Machinery and Chemical Corp.* Wolff was manager of FMC's *Anderson-Barngrover Division's* methods and standards department prior to this promotion.

JOHN RUSSELL LITTLE, formerly Eastern regional manager for *Radio Corporation of America*, elected president and general manager of *Golden State Co., Ltd.*, succeeding PAUL YOUNG, resigned.

C. D. LAFFERTY, general industrial agent for *Southern Pacific Co.*, appointed chairman of a nine county industrial dispersal task force organized by *San Francisco Bay Area Council, Inc.*, by request of the chairman of the National Security Resources Board.

THOMAS G. LAMPHIER, JR., elected vice president of *Consolidated Vultee Aircraft Corp.* Lamphier joined Convair last April, serving as assistant to president. E. K. YOUNG resigns as Los Angeles Chamber of Commerce industrial engineer to join engineering department at Vultee's guided missile plant in Pomona. Young will guide plant layout and production methods.

JAMES DALE appointed chief TV and radio engineer for *Hoffman Radio Corp.*, Los Angeles.

Colorado

JOHN W. RIESING succeeds A. L. SPRINGER as fleet maintenance superintendent for *Pacific Intermountain Express Co.*, Denver. Springer transfers to company's main office in Oakland, Calif., to become director-

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The Lufkin Line

By VIC FAWCETT

"About Pipelining"

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Vic Fawcett

Twin Lufkin M-189 Medium Speed Herringbone Gear Increasers, rated at 500 hp. each, are driven by Enterprise Diesel Engines. The Lufkin Gears in turn drive United Iron Works' Centrifugal Pumps. This hook-up of heavy duty equipment runs like clockwork. Loading at the rate of eleven to twelve barrels per hour, a 100,000-barrel tanker is ready to sail after a few hours of continuous pumping.

This installation is recognized—up and down the coast—as a fine job of engineering, a tribute to its designers and to the manufacturers of the equipment.

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Our monthly magazine is full of interesting, factual information for industry . . . and it has a pretty husky humor department. If you'd like to receive it, write (on your company letterhead), and you'll be on the list.

OFFICES Pacific Coast Headquarters and Warehouse—located in Los Angeles at 5959 S. Alameda St. Agency—Adam Hill Co., 299 Ninth St., San Francisco.

That's all for now

Vic Fawcett

transportation and properties. W. J. BEYER appointed assistant fleet maintenance superintendent; LEVI J. REYNOLDS promoted to general foreman; L. C. COLBURN to overhaul foreman, and JERRY SANDLIN to service foreman, all at Denver's general shops.

ALLEN J. WOOLLEY, manager of Swift & Co.'s Denver dairy and poultry plant, retires after 41 years of service.

Idaho

GARNET MCCALL replaces JOHN ANDERSON as mill superintendent of the Ima property of Bradley Mining Co., near Patterson. Anderson transfers to become mill foreman at the 2,400-ton concentrator at Stibnite.

Montana

GEORGE C. FLOYD named administrative vice president of Vanadium Corp. of America, New York City. Floyd resigns as works manager of Thomas Strip Division, Pittsburgh Steel Co., Butte.

New Mexico

HENRY A. SPAVIN appointed chief, fire protection engineering branch, and EDWIN L. BRAWLEY appointed chief, safety engineering branch, of the Safety and Fire Protection Division of the Atomic Energy Commission's Santa Fe operations.

Utah

BRUCE CLEMMER, metallurgist and administrator for the Bureau of Mines, named chief of the Intermountain Experiment Station, Salt Lake, succeeding S. R. ZIMMERLEY. Clemmer, who also heads the metallurgical division in Region IV, comes from the Southwest Experiment Station, Tucson, Ariz. Zimmerley resigns to become director of research for Western Mining Division of Kennecott Copper Corp.

HELMAR C. JOHNSON replaces A. C. ENSIGN as head of the Monticello uranium mill operated by Galigher Co., Salt Lake City, for the U. S. Atomic Energy Commission. Ensign will remain as a consultant for the company.

N. L. JENSEN, assistant chief chemist at the Midvale plant of U. S. Smelting & Refining Co., promoted to chief chemist succeeding JAMES E. POWELL, retired. HAROLD J. SHAW replaces Jensen.

WALTHER MATHESIUS retires as president of Geneva Steel Company, becomes consultant at Chicago for Koppers Co. ALDEN ROACH becomes president of combined Columbia-Geneva Div. of U. S. Steel. LOREN J. WESTHAVER becomes v.p. and manager of Utah operations.

National Research Corp. appoints DR. JAMES H. GARDNER to the staff of the petrochemical research department.

W. J. O'CONNER, SR., former Utah department manager, American Smelting and Refining Co., elected president and general manager of Independent Coal and Coke Co., Salt Lake City.

Washington

Brown Trailers Corp., Spokane, appoints A. A. KEARNEY, former vice president in charge of sales, president, succeeding THOBURN C. BROWN.

Wyoming

H. C. LIVINGSTON, vice president of operations for Union Pacific Coal Co., Rock Springs, resigns to take a similar position with Truax-Trauer Coal Co., Chicago, Ill.

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ASSOCIATIONS ELECT

Rocky Mountain Oil industry Information Committee: District chairman, A. T. SMITH, general attorney, *Continental Oil Co.*

California Manufacturers Association, Industrial Waste Committee: Chairman, T. B. GIBSON, analyst, *Stauffer Chemical Co.*, San Francisco; Northern California vice chairman, W. S. REID, general manager, *American Smelting & Refining Co.*, San Francisco; Southern California vice chairman, HARVARD S. HICKS, *Shell Oil Co.*, Wilmington, Calif. **Legislative Committee:** Chairman, BURTON N. ARNDS, SR., president, *Sparkletts Drinking Water Corp.*, Los Angeles; Northern California vice chairman, T. C. MORONEY, secretary, *Honolulu Oil Corp.*, San Francisco; Southern California vice chairman, JOSEPH PENGILLY, vice president, *Square D Co.*, Los Angeles. **Taxation Committee:** Chairman, W. L. NEELY, *Nordstrom Valve Division of Rockwell Manufacturing Co.*, Oakland; Northern California vice chairman, J. F. THOMPSON, *Fibreboard Products, Inc.*; Southern California vice chairman, CLARENCE R. NISSEN, secretary-treasurer, *Pesco, Inc.*, Los Angeles.

Western States Council: President, D. W. CAMPBELL, general manager, *Long Beach Chamber of Commerce*; vice presidents, EARL REYNOLDS, manager of *Boise, Idaho, Chamber of Commerce*, and G. L. FOX, manager of *San Francisco Chamber of Commerce*; secretary-treasurer, HOWARD STEIB, manager of *Santa Barbara, Calif., Chamber of Commerce*.

Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

IRVING R. STERN joins *Marshank Sales Co.*, Los Angeles sales engineering representative, as a field engineer.



Ledbetter

GEORGE W. LEDBETTER appointed West Coast representative for *Electro-Snap Division of Exhibit Supply Co.*, Chicago, Ill., manufacturer of precision limit switches and electrical devices.

engineering staff of *Ira G. Perin Co.* Reece will handle East Bay accounts. Tingvall re-



Tingvall



Reece

HARRY W. GORDON appointed district manager in the Northwest for *The American Pulley Co.*, Philadelphia, Pa. Gordon, located in the Maritime Bldg., 911 Western Ave., Seattle, Wash., will cover Washington, Oregon, Montana, Idaho, Wyoming, British Columbia and Alberta, Canada.

ANDREW E. TINGVALL and O. DAVID REECE appointed to the Northern California sales-

places DAVID SIRT, transferred to the Southern California branch, and will handle San Francisco accounts.

E. M. SLONAKER elected vice president in charge of sales for *Willard Storage Battery Co. of California*, a subsidiary of *Willard Storage Battery Co.*, Cleveland, Ohio. Slonaker, former manager of related products for the parent company, will have headquar-

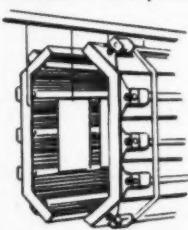
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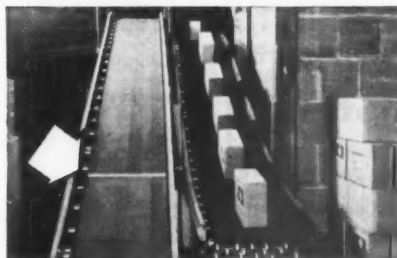
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For contract manufacturing and for sub-contracting parts and assemblies, use YUBA and save time, expense, and personnel worries. Our varied plant facilities enable us to handle almost any metal product—light or heavy. We have skilled workers and a long-time reputation for stable labor relations, plus years of experience in contract manufacturing and fabricating for private industry and government.

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ters at 5700 East Olympic Ave., Los Angeles, Calif.

W. L. GUSTAFSON named power industry sales manager for *Minneapolis-Honeywell Regulator Co.* west of Mississippi River. Headquarters are in San Francisco.

Sterling Electric Motors, Inc., Los Angeles, Calif., appoints *Berry Electric Co.*, 301 So. Third St., Walla Walla, Wash., and *Stanley Electric Motor Co.*, 1520 E. Miner Ave., Stockton 5, Calif., as distributors of Sterling electric power drives.

Crane Hoist Engineering Corp., designer and manufacturer of hand and electric traveling cranes, and exclusive distributor in California, Nevada and Arizona of *Shepard-Niles* cranes, hoists and repair parts, opens a new branch sales office and fabricating shop at 3637 Adeline St., Emeryville 8, Calif.

NEW BUILDING FOR FERNHOLTZ



Fernholtz Machinery Co. has moved to a new office building and warehouse at 8468 Melrose Place, Los Angeles.

Colorado Fuel & Iron Corp. appoints R. E. METZGER assistant to vice president in charge of sales.

ARTHUR W. MCGUIRE named assistant sales manager for *Arrowhead Rubber Co.*, Downey, Calif. McGuire was formerly sales manager of Aircraft Division for *Chicago Metal Hose Corp.*



Boezinger

Parker Aircraft Co., Los Angeles, names HAROLD A. CLOUGH assistant sales manager.

Garlinghouse Bros., 2415 E. Washington Blvd., Los Angeles, will now carry complete line of Lincoln lubricating equipment. These products will supplement Lubriplate lubricants for which the firm was recently appointed distributor.

Associated Iron & Metal Co. opens its new scrap yard at 200 Jibboom St., Sacramento, Calif. Facilities include 2,500 ft. of spur track, a 1,200 sq. ft. modern office building, and a 6,000 sq. ft. enclosed non-ferrous warehouse.

Alsynite Company of America opens a Los Angeles sales office in Suite 101, 3757 Wilshire Blvd. GLENN D. STECKER is named manager of new office.

Earle M. Jorgensen Co. expands its service to include distribution of Kaiser industrial Aluminum products in the Northern California, Nevada and Utah territory, according to *Kaiser Aluminum Sales, Inc.*

TRANS-BAY MOVE



New office and sales building of The Merrill-Brose Co. at 2792 Cypress St., Oakland, Calif. The firm, formerly located at 11th and Howard Sts., San Francisco, was recently appointed distributor in Northern California for the Bay Counties for International Harvester Co. and J. D. Adams Manufacturing Co.

Electronics Laboratory, Inc., Westbury, L. I., appoints *J. T. Hill Sales Co.*, Los Angeles, representative in California, Arizona and Nevada for pulse generators and other products. J. T. HILL is also appointed representative in the same area for *Control Engineering Co.*, Canton, Mass., maker of engine pressure pickups and related equipment.

A 2,200 sq. ft. one-story addition is under construction at *Drake Steel Supply Co.'s* Fresno, Calif., branch office. Cost of the new building is \$24,000.

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- Reliance on book values for fire insurance coverage is misleading and dangerous.

Actual cash values provably established and perpetuated by Continuous American Appraisal Service provide the basis for coverage, rating, and proof of loss.

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FOR SALE... USED 4' x 60' KILN

with trunnion bases, housings, oil burner, etc. In very good condition.
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cisco and other Western cities. R. JACKSON WEST succeeds Gerster as manager of the Los Angeles district office, and C. H. THRANE is appointed assistant manager of the district. O. BERT HUBENTHAL named Seattle district manager, replacing W. P. GULLANDER, who transfers to General Electric's Gas Turbine Division, Lockland, Ohio.

General Electric's Apparatus Division, Seattle, appoints HOWARD LONG welding products engineer for the Northwest district.

Westinghouse Electric Supply Co. opens a new office and warehouse at 215 South Fourth St., Albuquerque, N. M. The 9,000 sq. ft., one-story leased structure will serve as temporary headquarters, pending construction of a 25,000 sq. ft. office, warehouse and display building. G. M. DEKRAKER is manager of the new office.

ELLIOTT A. ALLEN appointed Pacific Coast district manager of New Hampshire Ball Bearings, Inc., manufacturer of MICRO ball

100 GENUINE 8 x 10 PHOTOS 10¢ ea

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FREE DELIVERY ANYWHERE
MADE DIRECT FROM 50 8 x 10 13¢ ea
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bearings. Allen will handle sales, engineering and servicing from his Los Angeles office at 1913 N. Vermont Ave.

JAMES P. KINNEY, formerly general sales manager of Philadelphia, Pa., Division, Yale & Towne Manufacturing Co., takes over that firm's distributorship in Los Angeles and Southern California.

The Black & Decker Manufacturing Co. opens a new building at 2432 So. Broadway, Los Angeles, to house firm's new sales and service branch. WALDO E. BLAIR is Los Angeles branch manager.

Electric Furnace Co. appoints CHARLES J. PAUMIER, Los Angeles, Pacific Coast representative.

Hoover fractional and small integral motors will now be distributed in Northern California by Eis-Hokin & Galvan, electrical contractor and distributor, located at 551 Mission St., San Francisco.

M. WM. SMITH named Northern California sales representative for Food Machinery and Chemical Corp.'s newly acquired subsidiary, Simplex Packaging Machinery, Inc., Oakland.

International Rectifier Corp. purchases a new factory building at 1521 East Grand Ave., El Segundo, Calif. Firm's former plant, located at 6809 S. Victoria Ave., Los Angeles, will be used for research and development. General sales and administrative offices are incorporated at the new building.

HARRY C. GERSTER appointed a vice president of General Electric Supply Corp., Los Angeles. He will supervise operations of a newly created Western Sales Region composed of Seattle, Wash., Portland, Ore., Salt Lake City, Utah, Denver, Colo., San Fran-

New factory for International Rectifier Corporation

Black & Decker opens new sales and service branch

(For more details, see items above)



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Johnston Stainless Welding Rods

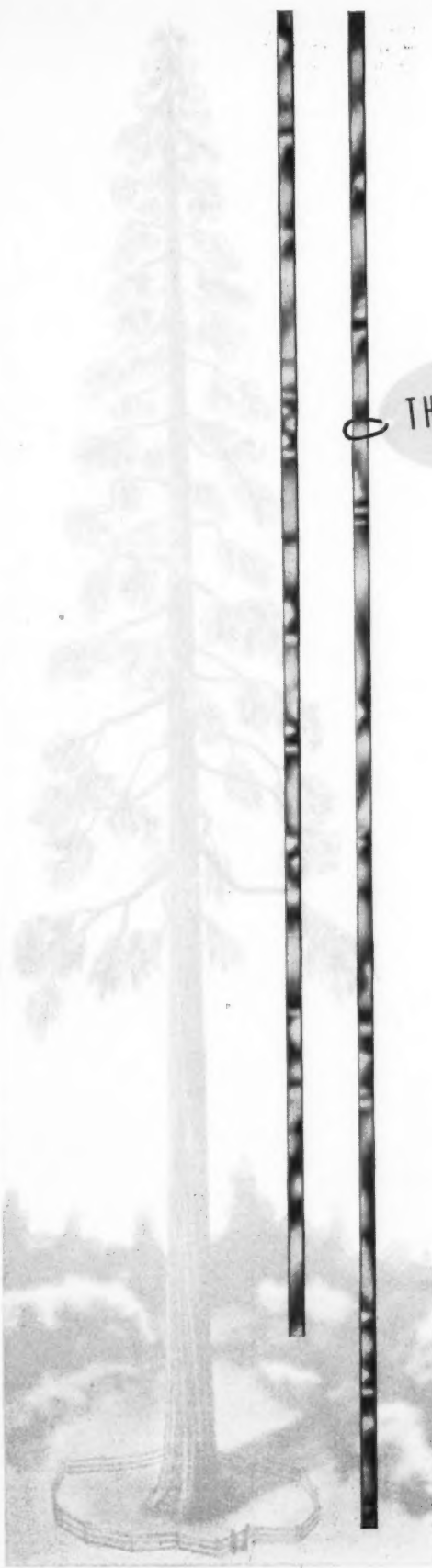
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609 Mission Street
San Francisco 5, Calif.

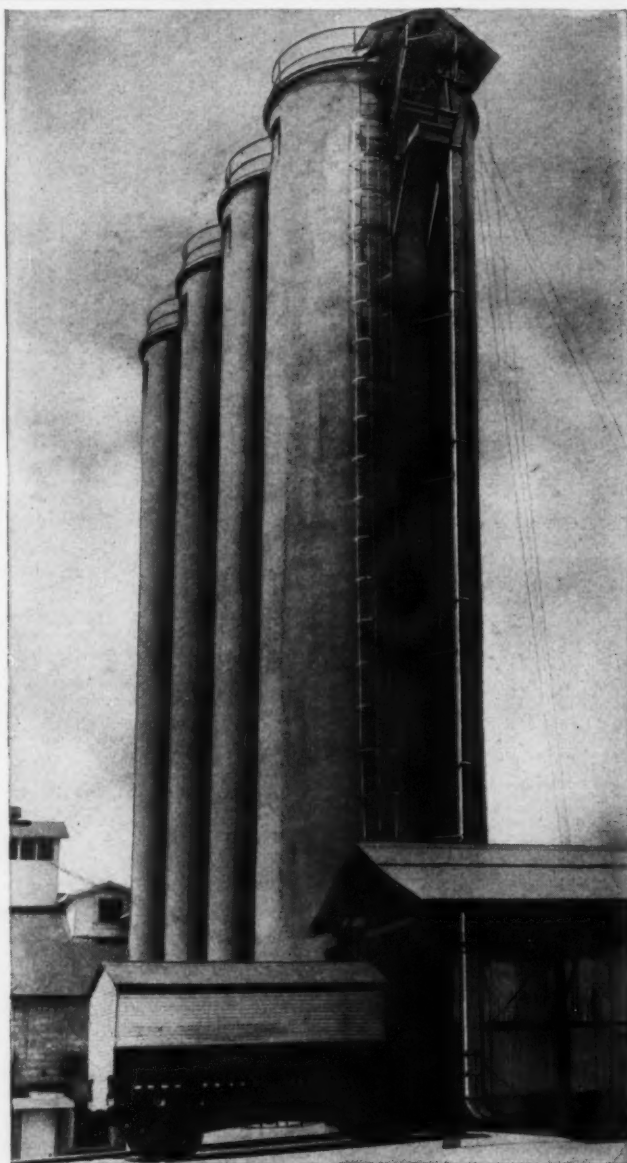
MANY FOOD PROCESSORS

COULD USE A

CONVEYOR SYSTEM

THAT'S

Working for Peanuts



"Keep them clean" . . . "Move them fast" . . . "Move them gently"! Those are the rules that must be followed for bulk handling of food products.

For these job specifications, Stephens-Adamson engineers had a ready answer. Out of the S-A Line including every type of bulk materials handling equipment they recommended a Redler Conveyor. A Redler System was installed. Its enclosed casings, compact, light-weight installation and low maintenance cost have amply satisfied every requirement.

To improve your bulk materials handling system or add new units, let these men co-operate. Problem-solving for you is our business. Write us!

Cinderella Foods Company Dawson, Georgia

Enclosed trucks deliver shelled peanuts to four receiving hoppers at sheltered loading platform. Horizontal length of REDLER Conveyor-Elevator in shallow trough loads from hoppers and curves into elevating run 78 feet up the side of the nearest silo. Product is then transferred to a 64-foot long horizontal REDLER Conveyor extending through rooms at the top of the silos. This enclosed conveyor discharges to any of the four silos. The REDLER conveying and elevating system was designed to handle 22 tons per hour at about 44 feet per minute.

151 Mission St., San Francisco 5, Calif.
1007 E. Burnside St., Portland 14, Ore.

STEPHENS-ADAMSON
2227 E. 37th STREET, MFG. CO. LOS ANGELES 58, CALIF.

Bulk Material Handling Equipment

Washington Machinery & Storage Co.
7329 E. Marginal Way, Seattle 8, Wash.

P. L. & R.
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